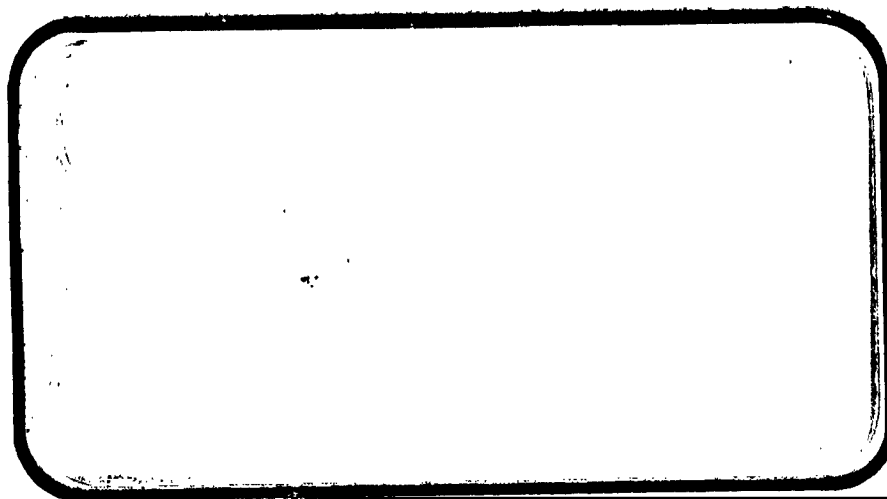




NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



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SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT

JOHNSON SPACE CENTER

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CHRYSLER
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VOLUME 3 OF 18

RESULTS OF TESTS OA12 AND IA9 IN THE
AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS
ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE
VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS

By

R. H. Spangler
Rockwell International

Prepared under NASA Contract Number NAS9-13247

By

Data Management Services
Chrysler Corporation Space Division
New Orleans, La. 70189

for

Engineering Analysis Division

Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas

WING TUNNEL TEST SPECIFICS:

Test Numbers: ARC 11-707 (A)
 ARC 97-707 (B)
 ARC 87-707 (C)
NASA Series Numbers: IA9A, B, C and
 OA12A, C
Test Date: 2 April - 17 May, 1973

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This document has been reviewed and is approved for release.

for N. D. Kemp
Data Management Services

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N. D. Kemp

RESULTS OF TESTS OAL2 AND IA9 IN THE
AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS
ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE
VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS

By

R. H. Spangler
Rockwell International

ABSTRACT

Tests were conducted in the NASA/ARC Unitary Plan Wind Tunnels during April and May 1973, on an 0.030-scale replica of the Space Shuttle Vehicle Configuration 2A. Aerodynamic loads data were obtained at Mach numbers from 0.6 to 3.5.

The investigation included Tests IA9A, B and C on the integrated (launch) configuration and Tests OAL2A and C on the isolated orbiter (entry configuration). The integrated vehicle was tested at angles of attack and sideslip from -8 degrees to +8 degrees. The isolated orbiter was tested at angles of attack from -15 degrees to +40 degrees and angles of sideslip from -10 degrees to +10 degrees as dictated by trajectory considerations. The effects of orbiter/external tank incidence angle and deflected control surfaces on aerodynamic loads were also investigated.

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INTRODUCTION

The 0.030-scale Aero Loads Space Shuttle model was tested in the Unitary Plan Wind Tunnels at ARC starting April 2, and continuing through May 17, 1973 as follows:

IA9A	11-foot Transonic	April 2 to April 14, 1973
OA12A	11-foot Transonic	April 16 to April 29, 1973
IA9C	8x7-foot Supersonic	April 23 to May 1, 1973
OA12C	8x7-foot Supersonic	May 2 to May 8, 1973
IA9B	9x7-foot Supersonic	May 9 to May 17, 1973

The testing was conducted in all three legs of the Unitary Plan Wind Tunnels to obtain a Mach number range from 0.6 to 3.5. Aerodynamic loads data were obtained for the ascent and entry configurations. The effects of control surface deflections were also investigated.

This report consists of 3 volumes of force data and 15 volumes of pressure data for a total of 18 volumes arranged in the following manner:

<u>VOLUME NO.</u>	<u>CONTENTS</u>
1	IA9A force data
2	IA9B and IA9C force data
3	OA12A and OA12C force data
4	IA9A plotted pressure data
5	IA9B and IA9C plotted pressure data
6	OA12A and OA12C plotted pressure data
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8	IA9A tabulated pressure data <ul style="list-style-type: none"> (a) OMS nozzle (b) body flap (c) OMS pod outside (d) lower wing surface
9	IA9A tabulated pressure data <ul style="list-style-type: none"> (a) upper wing surface (b) left vertical tail surface (c) right vertical tail surface (d) APU inlet (e) SRM booster base
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 - All components

NOMENCLATURE General

<u>SYMBOL</u>	<u>SI/USAC</u> <u>SYMBOL</u>	<u>DEFINITION</u>
u		speed of sound; m/sec, ft/sec
C_p	C_p	pressure coefficient; $(p_1 - p_\infty)/q$
M	MACH	Mach number; V/u
p		pressure; N/m^2 , psi
q	$q(NEM)$ $q(PSI)$	dynamic pressure; $1/2 \rho V^2$, N/m^2 , psi
Re/L	Re/L	unit Reynolds number; per m, per ft
V		velocity; m/sec, ft/sec
α	ALPHA	angle of attack, degrees
β	BETA	angle of sideslip, degrees
ψ	PSI	angle of yaw, degrees
ϕ	PHI	angle of roll, degrees
ρ		mass density; kg/m^3 , slugs/ft ³
<u>Reference & C.G. Definitions</u>		
A_b		base area; m ² , ft ²
b	BREF	wing span or reference span; m, ft
c.g.		center of gravity
\bar{c}_{REF}	LREF	reference length or wing mean aerodynamic chord; m, ft
S	SREF	wing area or reference area; m ² , ft ²
	MRP	moment reference point
	XMRP	moment reference point on X axis
	YMRP	moment reference point on Y axis
	ZMRP	moment reference point on Z axis

SUBSCRIPTS

b	base
l	local
s	static conditions
t	total conditions
∞	free stream

NOMENCLATURE (Continued)

Body-Axis System

<u>SYMBOL</u>	<u>SIADAC SYMBOL</u>	<u>DEFINITION</u>
C_N	CN	normal-force coefficient; $\frac{\text{normal force}}{qU}$
C_A	CA	axial-force coefficient; $\frac{\text{axial force}}{qU}$
C_Y	CY	side-force coefficient; $\frac{\text{side force}}{qU}$
C_{A_b}	CAB	base-force coefficient; $\frac{\text{base force}}{qU}$ $-A_b(p_b - p_\infty)/qU$
C_{A_f}	CAF	forebody axial force coefficient; $C_A - C_{A_b}$
C_m	CLM	pitching-moment coefficient; $\frac{\text{pitching moment}}{qS l_{REF}}$
C_n	CYN	yawing-moment coefficient; $\frac{\text{yawing moment}}{qS b}$
C_l	CBL	rolling-moment coefficient; $\frac{\text{rolling moment}}{qS b}$

Stability-Axis System

C_L	CL	lift coefficient; $\frac{\text{lift}}{qS}$
C_D	CD	drag coefficient; $\frac{\text{drag}}{qS}$
C_{D_b}	CDE	base-drag coefficient; $\frac{\text{base drag}}{qS}$
C_{D_f}	CDF	forebody drag coefficient; $C_D - C_{D_b}$
C_Y	CY	side-force coefficient; $\frac{\text{side force}}{qS}$
C_m	CLM	pitching-moment coefficient; $\frac{\text{pitching moment}}{qS l_{REF}}$
C_n	CLN	yawing-moment coefficient; $\frac{\text{yawing moment}}{qS b}$
C_l	CSL	rolling-moment coefficient; $\frac{\text{rolling moment}}{qS b}$
L/D	L/D	lift-to-drag ratio; C_L/C_D
L/D _f	L/DF	lift to forebody drag ratio; C_L/C_{D_f}

NOMENCLATURE (CONTINUED)

ADDITIONS TO STANDARD LIST

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
δ_R	RUDDER	rudder, surface deflection angle, positive deflection, trailing edge to the left; degrees.
δ_e	ELEVON	elevon, surface deflection angle, positive deflection, trailing edge down; degrees.
δ_{RF}	RUDFLR	rudder flare, split rudder deflection angle, left split rudder trailing edge left and right split rudder trailing edge right, $\delta_{RF} = (\delta_{RL} + \delta_{RR})/2$, positive deflection; degrees.
i_o	ORBINC	incidence angle between the orbiter and external tank, $i_o = \alpha_t - \alpha_b$; degrees.
β_T	BETAT	angle of sideslip of external tank.
α_T	ALPHAT	angle of attack of external tank.
l_B	LB	length of orbiter body; in.
l_T	LT	length of external tank; in.
l_s	IS	length of SRM booster; in.
l_{NM}	LNM	length of OMS nozzle, positive direction forward of exit plane; in.
l_{NP}	LNP	length of MPS nozzle, positive direction forward of exit plane; in.
$b/2$	BW	wing semi-span; in.
b_v	BV	vertical tail span; in.
x	X	distance from component nose; in.
y	Y	lateral distance from centerline; in.

NOMENCLATURE (CONCLUDED)

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
z	Z	vertical distance measured from W.L. 500 (vertical tail reference root chord); in.
c_w	CW.	local wing chord; in.
c_v	CV	local vertical tail chord; in.
x/l_B	X/LB	longitudinal position/orbiter body length.
x/l_T	X/LT	longitudinal position/external tank length.
x/l_S	X/LS	longitudinal position/booster length.
x/l_{NM}	X/LNM	longitudinal position/OMS nozzle length.
x/l_{NP}	X/LNP	longitudinal position/MPS nozzle length.
x/c_w	X/CW	local chordwise position/local wing chord length.
x/c_v	X/CV	local chordwise position/local vertical tail chord length.
$y/b/2$	Y/BW	local spanwise position/wing semi-span.
z/b_v	Z/BV	local spanwise position/vertical tail span.

CONFIGURATIONS INVESTIGATED

The 0.030-scale aero loads model was a replica of the Space Shuttle Vehicle 2A. It consisted of four major components: the orbiter, the external oxygen and hydrogen tank (ET) and two solid rocket boosters (SRB).

On the ascent configuration, the orbiter was strut mounted from the ET on a Task Corporation MK XVI 2.5-inch diameter internal balance. The left SRB was strut mounted from the ET on a Task Corporation MK XXII 1.5-inch diameter internal balance. No attempt was made to simulate actual inter-attachments. The ET was sting mounted to the tunnel model support system on a Task Corporation 4.0-inch diameter internal balance. The right SRB was strut mounted symmetrically to the left side, but did not contain a balance. The orbiter configuration, designated as O2A, consisted of B10C5D7W87V5R5M3P4.

The entry configuration consisted of the isolated orbiter, sting mounted to the tunnel model support system on a Task Corporation MK XXA 2.5-inch diameter internal balance. Midway through the OAL2C test, the MK XXA balance was damaged and was replaced by the MK XXB for the high angles of attack. The orbiter was provided with deflectable elevons by means of interchangeable brackets, deflectable rudder by means of a pin-indexed hinge, and interchangeable rudders to obtain different speed brake flare angles. The main propulsion system engines were removed during entry configuration testing to provide sting clearance. A cover plate was provided for the strut clearance hole.

The orbiter was instrumented with $3\frac{1}{4}$ pressure orifices on the left wing, left side of the fuselage, vertical tail, left OMS pod and engine, left and upper MPS engine and the base. The pressures were measured using eleven Scanivalve, Inc., S-type valve modules mounted internally (a five and a six gang unit). When tested in the entry configuration, the MPS pressures were not available for measurement.

The left side of the ET was instrumented with 136 pressure orifices. These pressures were measured by means of 7 Scanivalve, Inc., S-type valve modules configured as one unit of 6 modules and one single. These valves were mounted internally in the tank. The left SRB had one gang of six S-type modules to measure 102 pressures. The right SRB was not instrumented. The pressure transducers used in the valve modules were Statham PM 131 TC differential pressure transducers, with ranges of ± 10 psid, ± 12.5 psid and ± 15 psid. Reference and calibration pressures were measured by the ARC micro manometers.

Some modifications were made to the model at the test site prior to

CONFIGURATIONS INVESTIGATED (CONTINUED)

testing. These were as follows:

1. The forward tip of the ET containing the retro rocket package (Reference NR Drawing VL78-000C.8) was replaced with a flush 0.90 inch radius nose (Model scale). The new nose had five pressure taps; one in the nose and four more aft of the nose on the vertical and horizontal axis on a 0.315 inch radius.
2. The ET balance cavity was enlarged by one inch on the diameter (from 5 inches to 6 inches) to provide clearance for cable routing and eliminate balance interference.
3. The clearances around both the orbiter and the SRB struts were opened to approximately $1/8$ inch to prevent interference.
4. An alternate rudder hinge pin was provided to give a rudder deflection of +15 degrees.

Before and during the tests various model discrepancies developed or were discovered. These were generally minor and had only a negligible, if any, effect on the data. Significant discrepancies are noted below:

1. Pressure orifices P171 and P173 on the OMS pod base were omitted.
2. During the test certain pressure taps developed leaks or became plugged. Data from these taps are questionable and should be used with caution. Difficulties in checking may have resulted in erroneous indications of leakage. Repairs were made to correct leaking or plugged pressure instrumentation, whenever possible, as the test progressed. The following list gives those taps that were indicated as bad on the various leak and response checks:

ARC Facility	Run Nos.	Orifice numbers with questionable pressure data
11'	2-4	72, 163, 427
	5-118	31, 100, 123, 163, 201, 427
	119-160	16, 98, 101, 107, 333, 427
	161-170	16, 98, 101, 107, 333, 427, 306, 307, 327, 328, 336, 337, 356, 357, 375

CONFIGURATIONS INVESTIGATED (CONCLUDED)

<u>ARC Facility</u>	<u>Run Nos.</u>	<u>Orifice numbers with questionable pressure data</u>
11'	171-182	16, 47, 53, 75, 78, 98, 107, 201, 236, 237, 238, 307, 327, 365, 427
↓	183-189	Same as (171-182) + 7, 447, 525
↓	190-211	Same as (171-182)
8'x7'	220-234	20, 21, 24, 74, 326, 327, 336, 424, 427, 752, 868, 871
↓	235-285	74, 326, 327, 336, 424, 427, 752, 868, 871
↓	286-300	74, 107, 115, 124, 129, 138, 326, 327, 336, 427
↓	301-305	74, 326, 327, 336, 427
↓	306-333	74, 326, 327, 427
9'x7'	340-396	5, 325, 326, 327, 424, 427, 526, 752, 868, 871

TEST FACILITIES DESCRIPTION

Ames 11 x 11-Ft. Transonic

The Ames 11 x 11-Foot Transonic Wind Tunnel is a variable density, closed return, continuous flow type. This tunnel has an adjustable nozzle (two flexible walls) and a slotted test section to permit transonic testing over a Mach number range continuously variable from 0.4 to 1.4.

Ames 8 x 7-Ft. Supersonic

The Ames 8 x 7-Foot Supersonic Wind Tunnel is a closed-return, variable-density tunnel with a 8- by 7-foot rectangular test section. The nozzle has flexible side walls with fixed upper and lower surfaces. Mach number range is continuously variable from 2.45 to 3.5. Tunnel stagnation pressure can be varied from 0.3 to 2.0 atmospheres and Reynolds number per foot varies from 1.0×10^6 to 5.0×10^6 .

Ames 9 x 7-Ft. Supersonic

The Ames 9 x 7-Foot Supersonic Wind Tunnel is a variable density, continuous flow type with an adjustable nozzle to permit supersonic testing over a Mach number range continuously variable from 1.5 to 2.5. The nozzle is of the asymmetric, sliding-block type in which the variation of the test section Mach number is achieved by translating, in the streamwise direction, the fixed-contour block that forms the floor of the nozzle.

DATA REDUCTION

Standard procedures were utilized to reduce force and pressure data to coefficient form. The following dimensional constants were applied:

Reference Dimensions and Constants (Model Scale)

$$S_{Ref.} = 2.421 \text{ ft}^2$$

Orbiter reference area

$$L_{Ref.} = 39.849 \text{ in.}$$

Orbiter reference length

Base Areas (Model Scale)

$$A_{BOI} = 0.1903 \text{ ft}^2$$

Orbiter base area, integrated

$$A_{BOA} = 0.2362$$

Orbiter base area, sting mounted

$$A_{BMPSU} = 0.0417$$

Orbiter upper MPS base area

$$A_{BMPSL} = 0.0853$$

Orbiter lower MPS base area

$$A_{BACPS} = 0.0310$$

Orbiter ACPS base area on OMS pod

$$A_{BOMS} = 0.0231$$

Orbiter OMS nozzle base area

$$A_{BPOD} = 0.0257$$

Orbiter OMS pod base area

$$A_{CO} = 0.0611$$

Orbiter sting cavity base area

$$A_{BNOZ} = 0.0564$$

SRM nozzle base area

$$A_{BSKIRT} = 0.1729$$

SRM nozzle skirt base area

$$A_{BETI} = 0.3189$$

ET Base area

$$A_{CET} = 0.1964$$

ET Sting cavity base area

TEST : 0A12 / EA9

TABLE I.

DATE : May, 1973

TEST CONDITIONS

MACH NUMBER .	REYNOLDS NUMBER (per unit length)	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
0.6	4.0×10^6	540	120° NOM.
0.9	4.5	800	
1.1	4.0	800	
1.25	3.0	630	
1.4	3.0	650	
1.55	2.8	600	
2.0	2.3	490	
2.5	1.5	300	
3.0	2.0	350	Y
3.5	2.0	300	

FIVE (5) TASK CORPORATION BALANCES
BALANCE UTILIZED: WITH CAPACITIES AS FOLLOWS:

	ISOLATED ORBITER		INTEGRATED VEHICLE		
	ORBITER MK IIA	ORBITER MK IIB	ORBITER MK IIA	SRB MK IIA	ET MK IIB
NF	3000	3000	2400	1250	4000
NA	3000	3000	2400	1250	4000
YF	1500	1500	1200	500	2000
YA	1500	1500	1200	500	2000
X	600	600	1500	200	1000
R	4000	4000	4000	1000	10,000
SIZE	2.5"	2.5"	2.5"	1.5"	4.0"

COMMENTS: THE MARK IIA, 2.5IN DIA. BALANCE WAS
DAMAGED AFTER RUN 319. THE MARK IIB WAS
SUBSTITUTED FOR RUN 320 AND SUBSEQUENT RUNS

TABLE II.

TEST: ARC 11-707(IAP)										DATE: 4-27-72											
DATA SET/RUN NUMBER COLLATION SUMMARY																					
DATA SET IDENTIFIER	CONFIGURATION	SCHD. PARAMETERS/VALUES					NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					TEST RUN NUMBERS								
		α	β	δ_e	δ_R	δ_{FR}		L_0	0.6	0.9	1.1	1.25	1.4								
01	$\phi_{2A} = S_3 + T_9$	A	0	0	0	0	1.5	4	3	5	6	7									
02		A	0	0	0	0	0.5	5	8	18	28	38	48								
03		-8	B				0	4	0	19	29	39									
04		-6					0	10	10	20	30	40									
05		-4					0	11	11	21	31	41									
06		-2					0	12	12	22	32	42									
07		0					0	13	13	23	33	43	49								
08		2					0	4	14	24	34	44									
09		4					0	15	15	25	35	45									
10		6					0	16	16	26	36	46									
11		8					0	17	17	27	37	47									
12		-8	C				0	2			91	102									
13		-6					0				118	111									
14		-4					0				98	103									
15		-2					0				117	112									
16		0					0				99	104									
17		2					0				116	113									
18		4					0				100	105									
1																					
7																					
13																					
19																					
25																					
31																					
37																					
43																					
49																					
55																					
61																					
67																					
75																					
76																					
		COEFFICIENTS						IDVAR (1)						IDVAR (2)						NDV	
α OR β		$\alpha A = -8, -6, -4, -2, 0, 2, 4, 6, 8$						$\beta C = -8, -4, 0, 4, 8$													
SCHEDULES		$\beta B = -8, -6, -4, -2, 0, 2, 4, 6, 8$																			

TABLE II. CONTINUED

DATE: - - - - -

DATA SET/RUN NUMBER COLLATION SUMMARY

TEST: ARC - 11-707 (I.A.94)

DATA SET IDENTIFIER		CONFIGURATION	SCHD. PARAMETERS/VALUES						NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
			α β		δe	δR	δER	C _D		0.6	0.9	1.1	1.25																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
RBMx19		φ _{2A} + S ₃ + T ₇	6	C	0	-5	0	0.5	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

TABLE II. CONTINUED

[illegible]

TABLE II. CONTINUED

TEST: ARC 97-707(IA96)										DATE: 5-17-73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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TABLE II. CONTINUED

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DATA SET, RUN NUMBER COLLATION SUMMARY:

TEST: ADC 97-707 (IA98)

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	WAG NUMBERS (OR EQUIVALENT VARIABLE)		TEST RUN NUMBERS
		α	β	δe	δR	δo	δFF		1.55	2.0	
RB0x17	$02A + 53 + 79$	0	C	0	-10	0.5	0	2	375	381	
20		4	T	T	T	T	T	T	376	382	
21		6			↑				377	383	
22		8							378	384	
23		-8			+15				385	391	
24		-4			T				386	392	
25		0							387	393	
26		4							388	394	
27	↑	6	↑	↑	↑	↑	↑	↑	389	395	
28		8							390	396	

α OR β

SCHEDULES

COEFFICIENTS

1 7 13 19 25 31 37 43 49 55 61 67 73 79

EVAS (1) EVAS (2) NEW

TABLE II. CONTINUED

DATE: 5-1-73

DATA SET/RUN NUMBER COLLATION SUMMARY

TEST: APC 8*7-707 (1A9C)

DATA SET 1 / RUN NUMBER										MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)												
DATA SET IDENTIFIER	CONFIGURATION	SCHD.				PARAMETERS/VALUES				NO. OF RUNS	2.5				3.0				3.5			
		α	β	δc	δR	δFR	ζ_0	δc	δR		δFR	ζ_0	δc	δR	δFR	ζ_0	δc	δR	δFR	ζ_0		
RBNx01	$\theta_{2A} + S_3 + T_9$	A	0	0	0	0	0	0	0	0.5	3	240	230	220	241	231	221	242	232	222		
02		-8	B	T	T	T	T	T	T	T	T	243	233	223	244	234	224	245	235	225		
03		-6	T	T	T	T	T	T	T	T	T	246	236	226	247	237	227	248	238	228		
04		-4	T	T	T	T	T	T	T	T	T	249	239	229	257	256	250	267	256	250		
05		-2	T	T	T	T	T	T	T	T	T	266	257	251	266	257	251	266	257	251		
06		0	T	T	T	T	T	T	T	T	T	265	258	252	265	258	252	265	258	252		
07		2	T	T	T	T	T	T	T	T	T	264	259	253	264	259	253	264	259	253		
08		4	T	T	T	T	T	T	T	T	T	263	260	254	263	260	254	263	260	254		
09		6	T	T	T	T	T	T	T	T	T	262	261	255	262	261	255	262	261	255		
10		8	T	T	T	T	T	T	T	T	T											
11		-8	C	T	-15	T	T	T	T	T	T											
12		-4	T	T	T	T	T	T	T	T	T											
13		0	T	T	T	T	T	T	T	T	T											
14		4	T	T	T	T	T	T	T	T	T											
15		6	T	T	T	T	T	T	T	T	T											
16		8	T	T	T	T	T	T	T	T	T											

1	7	13	19	25	31	37	IDVAR (3)	IDVAR (2)	NDV
COEFFICIENTS									
$\alpha A = -8, -6, -4, -2, 0, 2, 4, 6, 8$									
$\beta B = -8, -6, -4, -2, 2, 4, 6, 8$									
$\beta C = -8, -6, -4, 0, 4, 6, 8$									

TABLE II. CONTINUED

DATE: 5-1-73

DATA SET/RUN NUMBER COLLATION SUMMARY

TEST: ARC 8x7-707 (IAPC)

TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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RBNx 17	$\theta_{2A} + S_3 + T_9$	-8	C	0	-10	0	0.5	3		274	280*	268																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

TABLE II. CONTINUED

TEST : AMES 11-707 (OA-2A)

DATE : 4-23-73

DATA SET/RUN NUMBER COLLATION SUMMARY

TEST RUN NUMBERS

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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RBPC01	B0C5-D7-N2-E4-M3-N6-5-R3-W0-F0	A	0	0	0	0	2	119	125																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

TABLE II. CONTINUED

TEST: AMES 11-707 (0412A)										DATE: 4-23-73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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REP-19	B ₁₀ C ₅ D ₁ N ₂ Q ₂ M ₂ N ₂ V ₂ Q ₂ W ₂ E ₁₀	10	D	+10	0	0	2	153	157																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								</

TABLE II. CONTINUED

[illegible]

TABLE II. CONTINUED

TEST: 87-707 (0A12C)		DATA SET/RUN NUMBER COLLATION SUMMARY										DATE: 5-9-73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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TABLE II. CONCLUDED

TEST: 87-707 (ΦA12C)

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE: 5-9-73

[illegible]

TABLE III. MODEL COMPONENT DIMENSIONAL DATA

MODEL COMPONENT: B10 Body

GENERAL DESCRIPTION: Fuselage, 2A Configuration, Lightweight Orbiter, per

Rockwell Lines VL70-000089 "B."

Scale Model = .030

DRAWING NUMBER: VL70-000089 "B"
VL70-000092, 93, 94 "A"

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length ~ IN	<u>1328.3</u>	<u>39.8490</u>
Max. Width ~ IN (@X ₀ = 1528.3)	<u>265.0</u>	<u>7.9500</u>
Max. Depth ~ IN. (@X ₀ = 1480.52)	<u>248.0</u>	<u>7.4400</u>
Finess Ratio	<u>5.012</u>	<u>5.012</u>
Area ~ Ft ²		
Max. Cross-Sectional	<u>456.4</u>	<u>.42076</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: Canopy - C5

GENERAL DESCRIPTION: 2A. Configuration per Lines VL70-000092

Scale Model = .030

DRAWING NUMBER: VL70-000092

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length (STA FWD Bulkhead)	<u>391.0</u>	<u>11.730</u>
Max. Width (T.E. Bulkhead)	<u>560.0</u>	<u>16.800</u>
Max. Depth (WP = 42.9 22 to = 500)	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area	<u> </u>	<u> </u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: Manipulator Housing D-7

GENERAL DESCRIPTION: 2A Configuration per Rockwell Lines VL70-000093

Scale Model = .030

DRAWING NUMBER: VL70-000093

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length ~ IN.	<u>881.00</u>	<u>26.430</u>
Max. Width ~ IN.	<u>51.00</u>	<u>1.530</u>
Max. Depth ~ IN.-	<u>23.00</u>	<u>.690</u>
Fineness Ratio	<u> </u>	<u> </u>
Area	<u> </u>	<u> </u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
E Fuselage BP = 0.00		
WP = 500.0 IN. FS		
X.426.0 to 1307.0 IN. FS		

TABLE III. (CONTINUED)

MODEL COMPONENT: WING-W87 New Light Weight Orbiter

GENERAL DESCRIPTION: Orbiter Configuration Per Lines VL70-000093.

NOTE: (Dihedral Angle is defined at the lower surface of the Wing at the 75.33%

element line projected into a plane perpendicular.

Scale Model = .030

TEST NO.	DWG. NO.	VL70-000093	
DIMENSIONS:	FULL-SCALE	MODEL SCALE	
TOTAL DATA			
Area (Theo.) Ft ²	2690.00	2.42100	
Planform	936.68	28.10040	
Span (Theo In.	2.265	2.265	
Aspect Ratio	1.177	1.177	
Rate of Taper	0.200	0.2000	
Taper Ratio	3.5000	3.500	
Dihedral Angle, degrees	3.000	+3.00	
Incidence Angle, degrees	3.500	+3.000	
Aerodynamic Twist, degrees			
Sweep Back Angles, degrees			
Leading Edge	45.00	45.00	
Trailing Edge	-10.24	-10.24	
0.25 Element Line	35.209	35.209	
Chords:			
Root (Theo) B.P.O.O.	689.24	20.67720	
Tip, (Theo) B.P. 46834	137.85	4.13550	
MAC	474.81	14.24430	
Fus. Sta. of .25 MAC	1136.89	34.10670	
W.P. of .25 MAC	299.20	8.97840	
183.13 B.L. of .25 MAC	182.13	5.46390	
EXPOSED DATA			
Area (Theo) Ft ²	1752.29	1.57706	
Span, (Theo) In. BP108 to 468.341	720.68	21.62040	
Aspect Ratio	2.058	2.058	
Taper Ratio	.2451	.2451	
Chords			
Root BP108	562.40	16.8720	
Tip 1.00 $\frac{b}{2}$	137.85	4.13550	
MAC	393.03	11.79090	
Fus. Sta. of .25 MAC	1185.31	35.55930	
W.P. of .25 MAC	300.207	9.00621	
B.L. of .25 MAC	143.76	4.31280	
Airfoil Section (Rockwell Mod NASA)			
XXXX-64			
Root $\frac{b}{2}$ = .425	.10	.10	
Tip $\frac{h}{2}$ = 1.00	.12	.12	
Data for (1) of (2) Sides			
Leading Edge Cuff	120.33	10830	
Planform Area Ft ²	560.0	16.80	
Leading Edge Intersects Fus M. L. @ Sta	1035.0	31.050	
Leading Edge Intersects Wing @ Sta			

TABLE III. (CONTINUED)

MODEL COMPONENT: Eleven E-18GENERAL DESCRIPTION: 2A Configuration Per W-87 Rockwell Lines VL 70-000093Data for (1) of (2) SidesScale Model = .030DRAWING NUMBER: VL 70-000093DIMENSIONS:

	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area ~ ft^2	<u>205.52</u>	<u>.18497</u>
Span (equivalent) ~ IN.	<u>353.34</u>	<u>10.60020</u>
Inb'd equivalent chord	<u>114.78</u>	<u>3.44349</u>
Outb'd equivalent chord	<u>55.00</u>	<u>1.6500</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>.208</u>	<u>.208</u>
At Outb'd equiv. chord	<u>.400</u>	<u>.400</u>
Sweep Back Angles, degrees		
Leading Edge	<u>0.00</u>	<u>0.00</u>
Tailing Edge	<u>-10.24</u>	<u>-10.24</u>
Hingeline	<u>0.00</u>	<u>0.00</u>
Area Moment (Normal to hinge line) ft^3	<u>1548.07</u>	<u>.04180</u>
Product of Area Moment		

TABLE III. (CONTINUED)

MODEL COMPONENT: VERTICAL - V5 (Light Weight Orbiter Configuration)GENERAL DESCRIPTION: Centerline Vertical Tail, Double Wedge Airfoil with Rounded Leading Edge

Scale Model = .030

DRAWING NUMBER:

VL70-000095DIMENSIONS:FULL-SCALEMODEL SCALETOTAL DATA

Area (Theo) Ft^2	<u>413.25</u>	<u>.37192</u>
Planform		
Span (Theo) In	<u>315.72</u>	<u>9.47160</u>
Aspect Ratio	<u>1.675</u>	<u>1.675</u>
Rate of Taper	<u>0.507</u>	<u>0.507</u>
Taper Ratio	<u>.404</u>	<u>.404</u>
Sweep Back Angles, degrees		
Leading Edge	<u>45.000</u>	<u>45.000</u>
Trailing Edge	<u>26.249</u>	<u>26.249</u>
0.25 Element Line	<u>41.130</u>	<u>41.130</u>
Chords:		
Root (Theo) WP	<u>268.50</u>	<u>8.05500</u>
Tip (Theo) WP	<u>108.47</u>	<u>3.25410</u>
MAC	<u>199.81</u>	<u>5.99430</u>
Fus. Sta. of .25 MAC	<u>1463.50</u>	<u>43.90500</u>
W. P. of .25 MAC	<u>635.522</u>	<u>19.06566</u>
B. L. of .25 MAC	<u>0.00</u>	<u>0.00</u>
Airfoil Section		
Leading Wedge Angle Deg	<u>10.000</u>	<u>10.000</u>
Trailing Wedge Angle Deg	<u>14.920</u>	<u>14.920</u>
Leading Edge Radius IN.	<u>2.00</u>	<u>.96</u>
Void Area Ft^2	<u>13.17</u>	<u>.01185</u>
Blanketed Area Ft^2	<u>12.67</u>	<u>.01140</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: R-5 RudderGENERAL DESCRIPTION: 2A Configuration per Rockwell Lines VL 70-000095Scale Model = .030DRAWING NUMBER: VL 70-000095

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area ~ Ft ²	<u>106.38</u>	<u>.09574</u>
Span (equivalent) ~ IN.	<u>201.0</u>	<u>6.030</u>
Inb'd equivalent chord	<u>91.585</u>	<u>2.74755</u>
Outb'd equivalent chord	<u>50.833</u>	<u>1.52499</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>0.400</u>	<u>0.400</u>
At Outb'd equiv. chord	<u>0.400</u>	<u>0.400</u>
Sweep Back Angles, degrees		
Leading Edge	<u>34.83</u>	<u>34.83</u>
Tailing Edge	<u>26.25</u>	<u>26.25</u>
Hingeline	<u>34.83</u>	<u>34.83</u>
Area Moment (Normal to hinge line) ~ Ft ³	<u>526.13</u>	<u>.01421</u>
Product of Area and Mean Chord		

TABLE III. (CONTINUED)

MODEL COMPONENT: OMS Pod -M3

GENERAL DESCRIPTION: 2A Light Weight Configuration per Rockwell Lines

VL70-000094A

Scale Model = .030

DRAWING NUMBER: VL70-000094A

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length	<u>346.0</u>	<u>10.380</u>
Max. Width $X_1 = 1450.0$	<u>108.0</u>	<u>3.240</u>
Max. Depth $X_0 = 1500.0$	<u>113.0</u>	<u>3.390</u>
Fineness Ratio	<u> </u>	<u> </u>
Area	<u> </u>	<u> </u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

L of OMS Pod

WP = 463.9 IN. FS WP 400 + 63.9 = 463.9

BP = 80.0 IN. FS

Length 1214.0 to 1560.0' = 346.0 IN. FS

TABLE III. (CONTINUED)

MODEL COMPONENT: FL Body Flap

GENERAL DESCRIPTION: 2A Configuration per Rockwell Lines VL70-000094A

Scale Model = .030

DRAWING NUMBER: VL70-000094A

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length	<u>84.70</u>	<u>2.541</u>
Max. Width	<u>265.00</u>	<u>7.950</u>
Max. Depth	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area ~ Ft ²		
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u>142.64</u>	<u>.12838</u>
Wetted	<u> </u>	<u> </u>
Base Ft ²	<u>38.65</u>	<u>.03478</u>

TABLE III. (CONTINUED)
MODEL DIMENSIONAL DATA

MODEL COMPONENT : S3-Booster Solid Rocket Motor

GENERAL DESCRIPTION : 2A Configuration Per Rockwell Lines VL77-000012
& VL72-000061 "B"

Body of Revolution; Data for (1) of (2) Sides

Scale Model = .030

DRAWING NUMBER : VL 77-000012

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length ~IN.	<u>1732.0</u>	<u>51.96</u>
Max Width (DIA) IN. BSRM Tank	<u>142.0</u>	<u>4.260</u>
Max Depth (DIA) Aft Skirt	<u>259.0</u>	<u>7.77</u>
Fineness Ratio L/D	<u>6.687</u>	<u>6.687</u>
Area ~ Ft ²	<u> </u>	<u> </u>
Max. Cross-Sectional (Aft Skirt)	<u>365.87</u>	<u>.32928</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

Ref.

FS (Orbiter) = 0.00 = 747.99 IN. ET = 200.0 IN. BSRM

WP (BSRM) = WP 400(Orbiter) - 344.413 = 55.587 IN.

BP (Orbiter) = 0.00 = 243.0 IN. BSRM

TABLE III. (CONCLUDED)

MODEL COMPONENT: EXTERNAL TANK - T9

GENERAL DESCRIPTION: 2A Configuration

NOTE: T9 identical to T8 W/O retro pkg., nose w/30"R F.S.

DRAWING NUMBER

NONE

DIMENSION:

FULL SCALE

MODEL SCALE

Length - IN.

1858

55.740

Max Width (Dia) - IN.

324.0

9.720

Max Depth

Fineness Ratio L/D

5.73457

5.73457

Area - FT²

Max Cross-Sectional

572.56

0.51530

Planform

Wetted

Base

Nose, Radius, IN.

30.0

ORBITER BODY

ORBITER STATION ~ X_0			RADIAL LOCATION θ ~ DEGREES																	
FULL	MODEL	X_0 / l	0	20	40	55	70	90	105	110	120	135	142	150	157	162	165	169	172	180
200	6.00	0	20					22												23
210	6.30	.008	21					29			30			31						32
225	6.75	.019	24	25	26	27	28	29			39			40						41
245	7.35	.034	33	34	35	36	37	38			48			49						50
280	8.40	.060	42	43	44	45	46	47			57			58						59
380	11.40	.136	51	52	53	54	55	56							61				60	
400	12.00	.151																		
410	12.30	.158																		
430	12.90	.173	62	63	64	65	66	67			68		73	69		70		71		72
460	13.80	.196																		
500	15.00	.226	74	75	76	77	78	79			80			81			82			83
560	16.80	.271	84		85		86	87			88			89			90			91
625	18.75	.320	92		93		94	95			96			97			98			99
725	21.75	.395	100		101		102	103			104			105			106			107
880	26.40	.512	108		109		110	111			112			113			114			115
980	29.40	.587	116		117		119	120			121			122			123			124
1080	32.40	.662			118		125	126			127			128						129
1180	35.40	.738					131	132			134	135		136			137			138
1245	37.35	.787			130		140	141	133		143	144		145			146			
1300	39.00	.828			139		148	149	142		151	152		153			154			
1375	41.25	.885			147		156	157	150		159	160		161			162			
1430	42.90	.926			155		164	165	158		167	168		169			170			
1480	44.40	.964	163						166											
1530 ^a	45.90	1.001								171	173									
1530 ^b	45.90	1.001								172	174									

^a OMS POD, INSIDE

^b OMS POD, OUTSIDE

a. Orbiter body

Table IV. Pressure Orifice Locations

ORBITER BASE

LOCATION	ORIFICE NUMBERS
ORBITER BASE (INTEGRATED)	1, 2, 3, 4
LEFT MPS NOZZLE BASE	5
UPPER MPS NOZZLE BASE	6
ACPS BASE AREA ON OMS POD	7
OMS NOZZLE BASE	8
OMS POD BASE	9
ORBITER BASE (STING MOUNT)	11, 12, 13, 14
ORBITER STING CAVITY	15, 16

BODY FLAP LWR SURFACE

ORB. STA. ~ X ₀	θ ~ DEG
FULL MODEL	0 40
1580	47.40 175 176

OMS NOZZLE

X ~ IN FWD BASE	θ ~ DEG
FULL MODEL	135 180 225
10 0.30	177 178 180
20 0.60	177 178 180

MPS NOZZLE

X ~ IN. FWD BASE	θ ~ DEG
FULL MODEL	0 90 135 180 225 270
25 0.75	181 182 183 184 185 186
50 1.50	187 188 189 190 191 192
75 2.25	193 194 195 196 197 198

VERTICAL TAIL

WATER PLANE ~ Z ₀		X/C ~ THEORETICAL VERTICAL CHOED									
FULL	MODEL	7v	0	.05	.15	.30	.52	.65	.775	.90	
525	15.75	.079	400								
550	16.50	.158	L	411	412	413	414	415	416		
600	18.00	.316	R	511	512	513	514	515	516		
690	20.70	.60	L	421	422	423	424	425	426	427	
765	22.95	.84	R	521	522	523	524	525	526	527	
792	23.76	.925	L	431	432	433	434	435	436	437	
			R	531	532	533	534	535	536	537	
			L	441	442	443	444	445	446	447	
			R	541	542	543	544	545	546	547	
			L	451	452	453	454	455	456	457	
			R	551	552	553	554	555	556	557	

b. Orbiter Base, Body Flap Lower Surface, and Vertical Tail

Table IV. Continued.

ORBITER WING

ORBITER B.P. - Y		X/C - THEORETICAL WING CHORD																					
PULL	MODEL	7	-.49	-.35	-.25	-.15	-.033	0.0	.05	.15	.25	.40	.55	.60	.65	.70	.725	.75	.775	.86	.90	.95	
140	4.20	.299	U 200	L 301		202 302		203 303	204 304		205 305							206 306		207 307	208 308	209 309	
170	5.10	.364	U 210	L 311		211 311		212 312															
200	6.00	.427	U 220	L 321			220	221 321	222 322			223 323	224 324					225 325		226 326	227 327	228 328	229 329
230	7.50	.534	U 230	L 331				231 331	232 332	233 333		234 334	235 335				236 336		237 337	238 338	239 339	240 340	
315	9.45	.673	U 250	L 351				251 351	252 352	253 353		254 354	255 355			256 356			257 357	258 358	259 359	260 360	
365	10.95	.780	U 260	L 361				261 361	262 362	263 363		264 364	265 365					266 366		267 367	268 368	269 369	
415	12.45	.897	U 270	L 371				271 371	272 372	273 373		274 374	275 375					276 376		277 377	278 378	279 379	

U - UPPER SURFACE L - LOWER SURFACE

7	X/C LOCAL WING CHORD
.299	0, .094, .229, .362, .497, .700, .834, .865, .900, .965
.364	0, .086, .246
.427	0, .081, .177, .402, .565, .760, .808, .857, .905, .953
.534	SAME AS THEORETICAL CHORD
.673	
.780	
.897	

c. Orbiter Wing
Table IV. Continued.

EXTERNAL TANK

TANK STA ~ XT			$\theta \sim \text{DEG}$									
FULL	MODEL	Y _T /L _T	0	30	60	90	120	135	150	165	180	270
316.	9.48	0	610			614					619	620
317.7	9.53	.001	611			624	625		627		629	
400	12.00	.045	621	622	623	634	635		637	638	639	
520	15.60	.110	631	632	633	644	645		647	648	649	
640	19.20	.174	641	642	643	654	655		657	658	659	
670	20.10	.191	651	652	653	664	665		667	668	669	
710	21.30	.212	661	662	663	674	675	676	677	678	679	
750	22.50	.234	671	672	673	684	685		687	688	689	
850	25.50	.287	681	682	683	694	695	696	697	698	699	
950	28.50	.341	691	692	693	704	705		707	708	709	
1050	31.50	.395	701	702	703	714	715	716	717		719	
1150	34.50	.449	711	712	713	724	725		727	728	729	
1250	37.50	.503	721	722	723	734	735	736	737		739	
1350	40.50	.557	731	732	733	744	745		747	748	749	
1500	45.00	.637	741	742	743			756	757		759	
1700	51.00	.745	751	752	753			766	767	768		
1900	57.00	.853	761	762	763			776	777	778		
2040	61.20	.929	771	772	773	774	775					
STING CAVITY			601								604	
BASE			602			603						

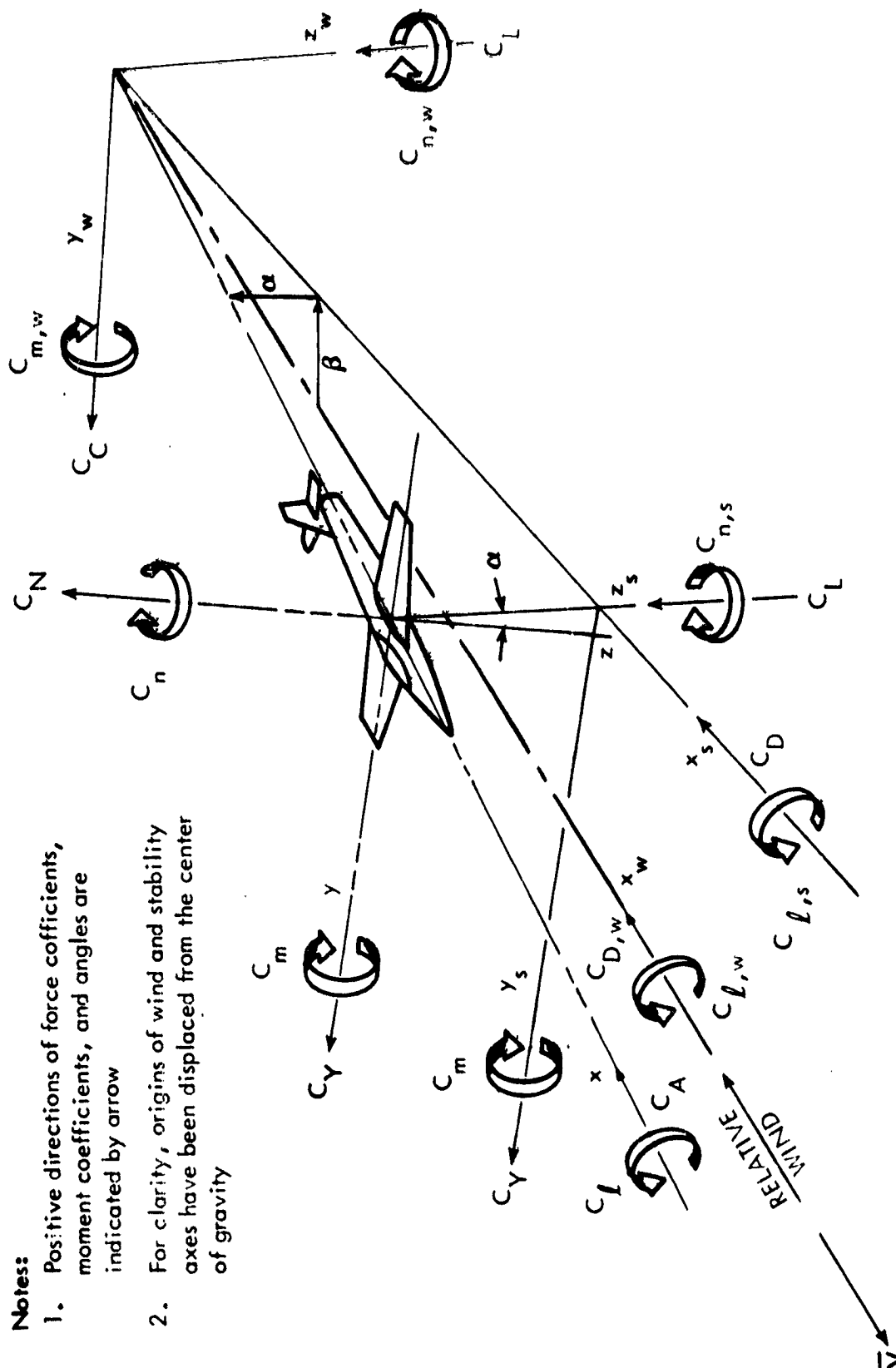
d. External Tank
Table IV. Continued.

LEFT SRM

SRM STATION ~ XS			θ ~ DEG							
FULL	MODEL	XS/L8	0	45	90	135	180	225	270	315
200	6.00	0	810							
260	7.80	.034	811	812	813	814	815	816	817	818
370	11.10	.097	821	822	823	824	825	826	827	828
400	12.00	.114	831	832	833	834	835	836	837	838
450	13.50	.142	841	842	843	844	845	846	847	848
550	16.50	.199	851	852	853	854	855	856	857	858
700	21.00	.284	861		863		865	866	867	868
850	25.50	.370	871		873		875		877	
1050	31.50	.484	881		883		885			
1250	37.50	.597	891		893		895			
1450	43.50	.711	901		903		905		907	
1650	49.50	.825	911		913		915		917	
1750	52.50	.882	921	922	923	924	925	926	927	928
1790	53.70	.904	931	932	933	934	935	936	937	938
1850	55.50	.939	941	942	943	944	945	946	947	948
1900	57.00	.967	951	952	953	954	955	956	957	958
NOZZLE BASE			801							
SKIRT BASE			802		803		804		805	

e. Left SRM

Table IV. Concluded.

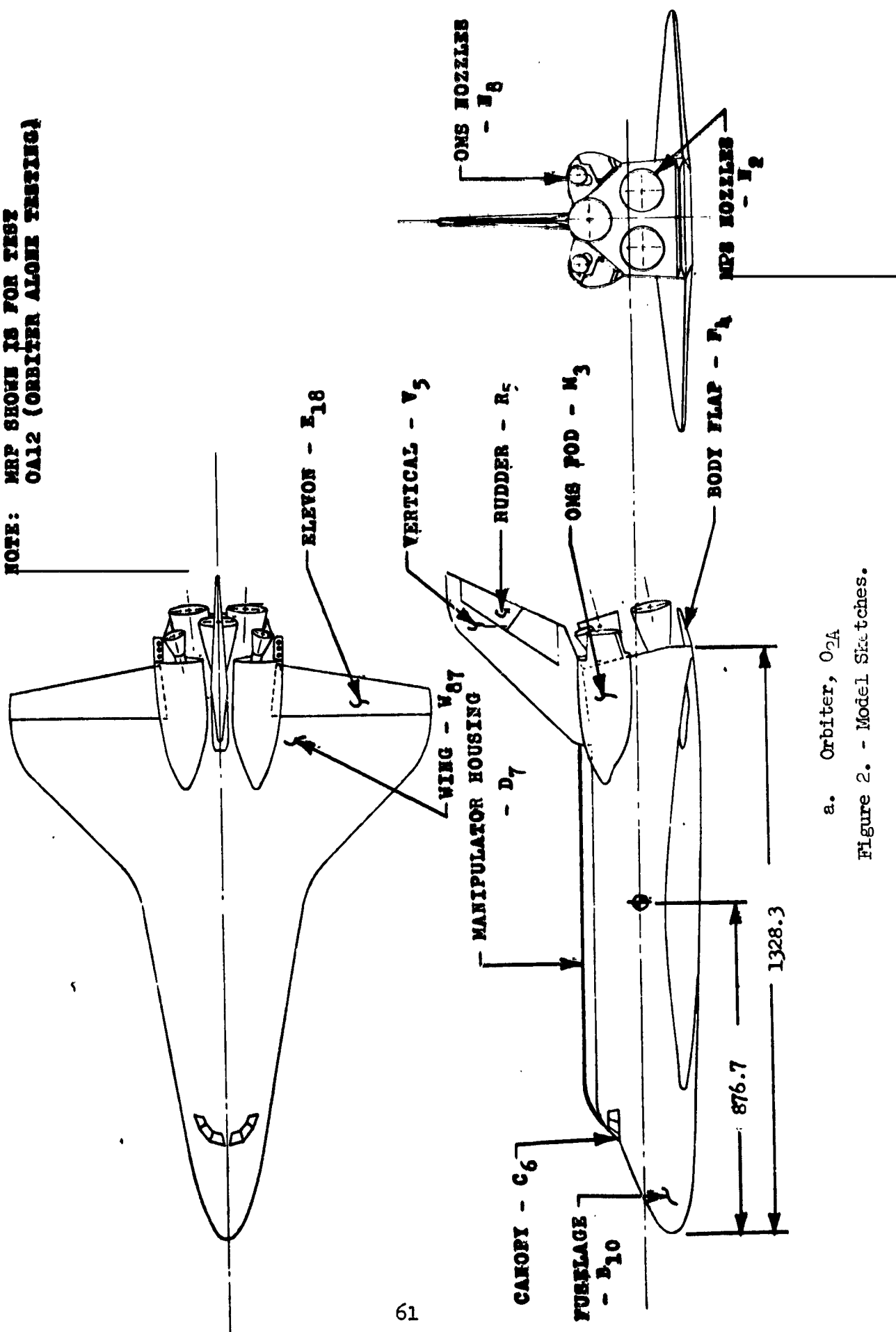


Notes:

1. Positive directions of force coefficients, moment coefficients, and angles are indicated by arrow
2. For clarity, origins of wind and stability axes have been displaced from the center of gravity

Figure 1. - Axis Systems.

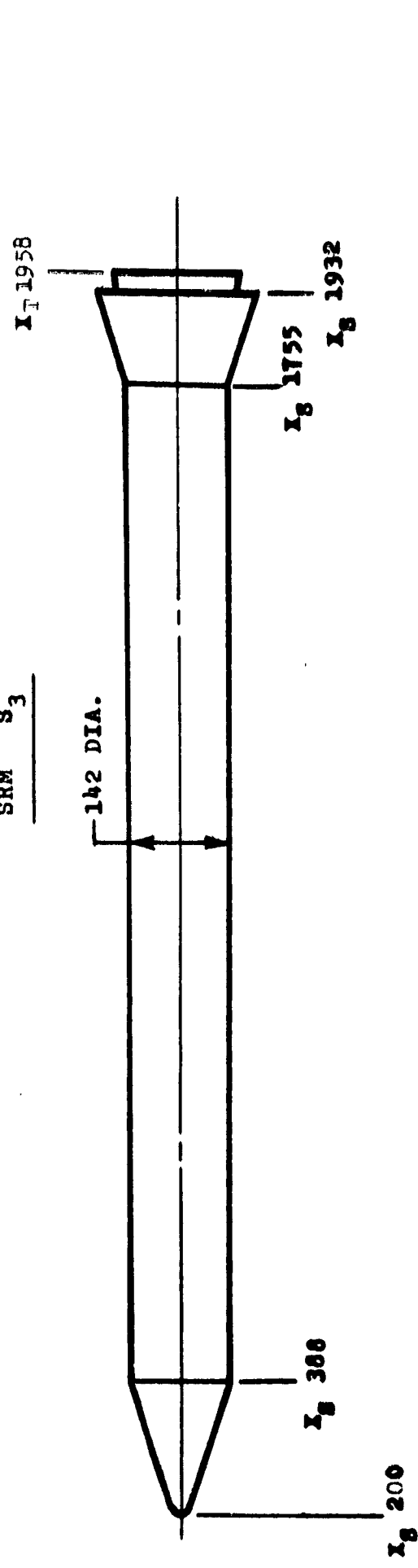
NOTE: MRP SHOWN IS FOR TEST
OAL12 (ORBITER ALONE TESTING)



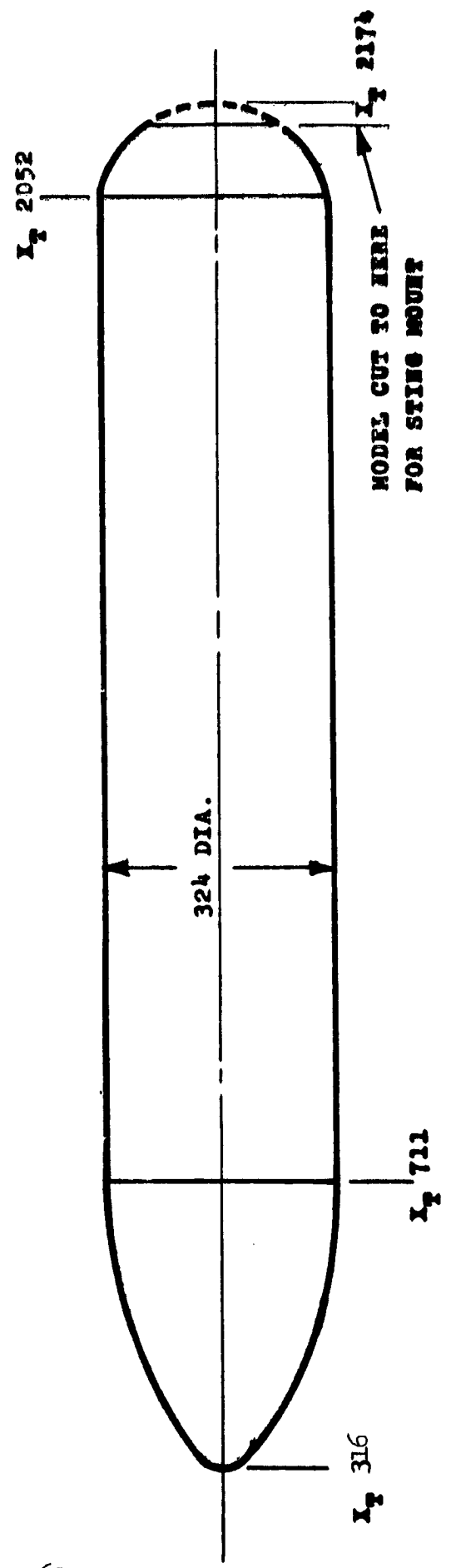
a. Orbiter, O_{2A}

Figure 2. - Model Sketches.

SRM S₃



EXTERNAL TANK T₉



b. SRM, S₃, and External Tank, T₉
Figure 2. - Continued.

- NOTES:**
- ORBITER INCIDENCE ANGLE
RELATIVE TO TANK CL IS 0.5°
 - ORBITER NOSE UP
 - ALL DIMENSIONS IN INCHES
 - FULL SCALE
 - X_0 - ORBITER FUSELAGE STATION
 - X_T - EXTERNAL TANK FUSELAGE
STATION
 - X_S - SRM FUSELAGE STATION

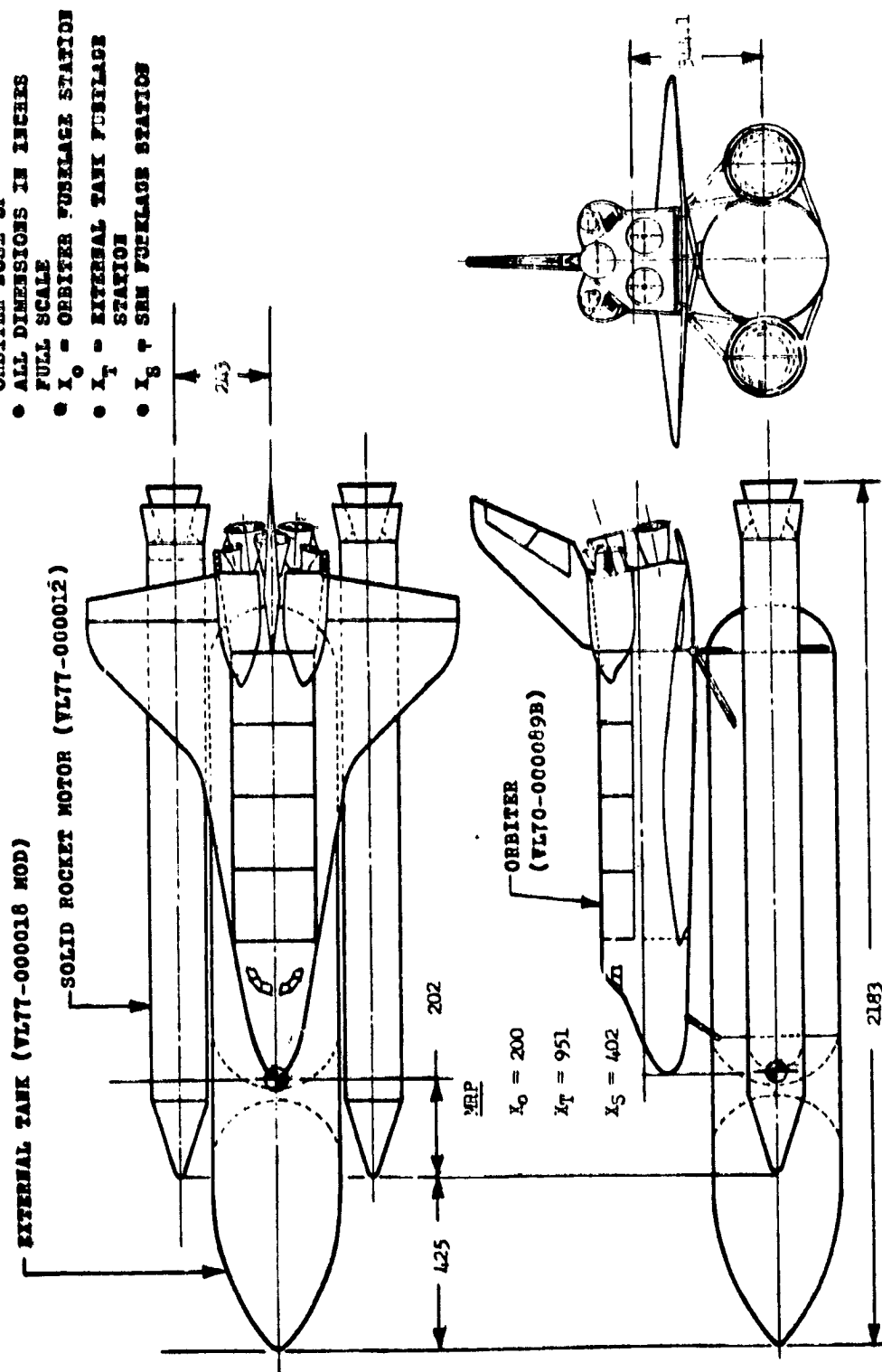


Figure 1 (Cont'd)
c. Integrated Vehicle

c. Integrated Vehicle
Figure 2. - Concluded.



a. Integrated (launch) Vehicle Mounted in the ARC 18' Ft. Tunnel

Figure 3. - Model Installation Photograph



b. Isolated Orbiter (Entry Configuration) Mounted in the ARC 8x7 Ft. Tunnel

Figure 3. - Concluded.



AMES 11-707 0A12 02A

(RBPO01)

SYMBOL	MACH	BETA	PARAMETRIC VALUES		REFERENCE INFORMATION
			ELEVON	RUDFLR	
○	.600		.000	.000	SREF 2.4210 SQ.FT.
□	.905		.000	.000	LREF 39.8490 IN.
		RUDER			BREF 39.8490 IN.
					XREF 32.3000 IN.
					YREF .0000 IN.
					ZREF .0000 IN.
					SCALE .0300

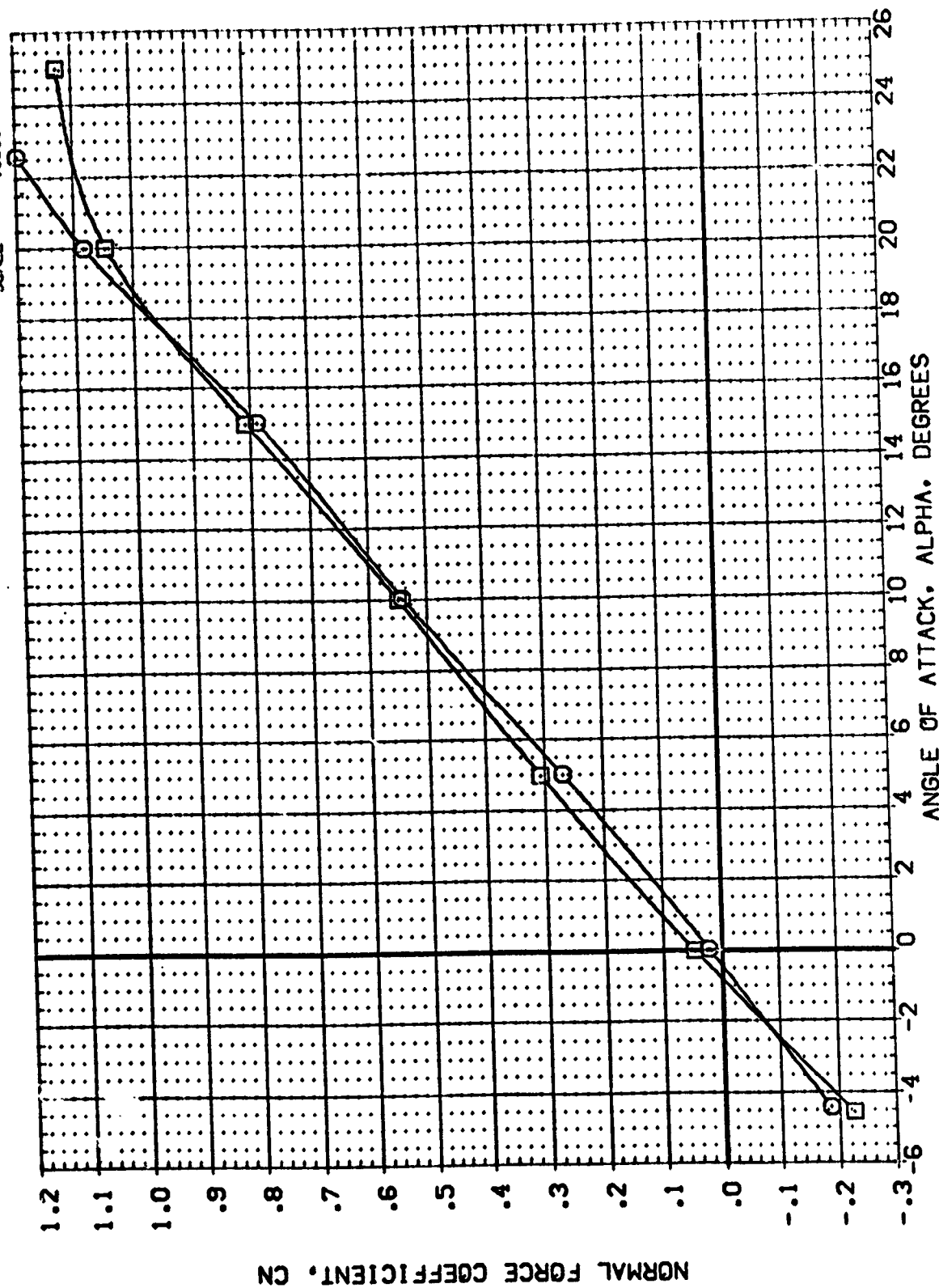


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905

(RBP001)

AMES 11-707 0A12 02A

SYMBOL MACH BETA RUDDER PARAMETRIC VALUES
□ .600 .000 .000 ELEVON .000
□ .905 .000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.845C
BREF 39.845C
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

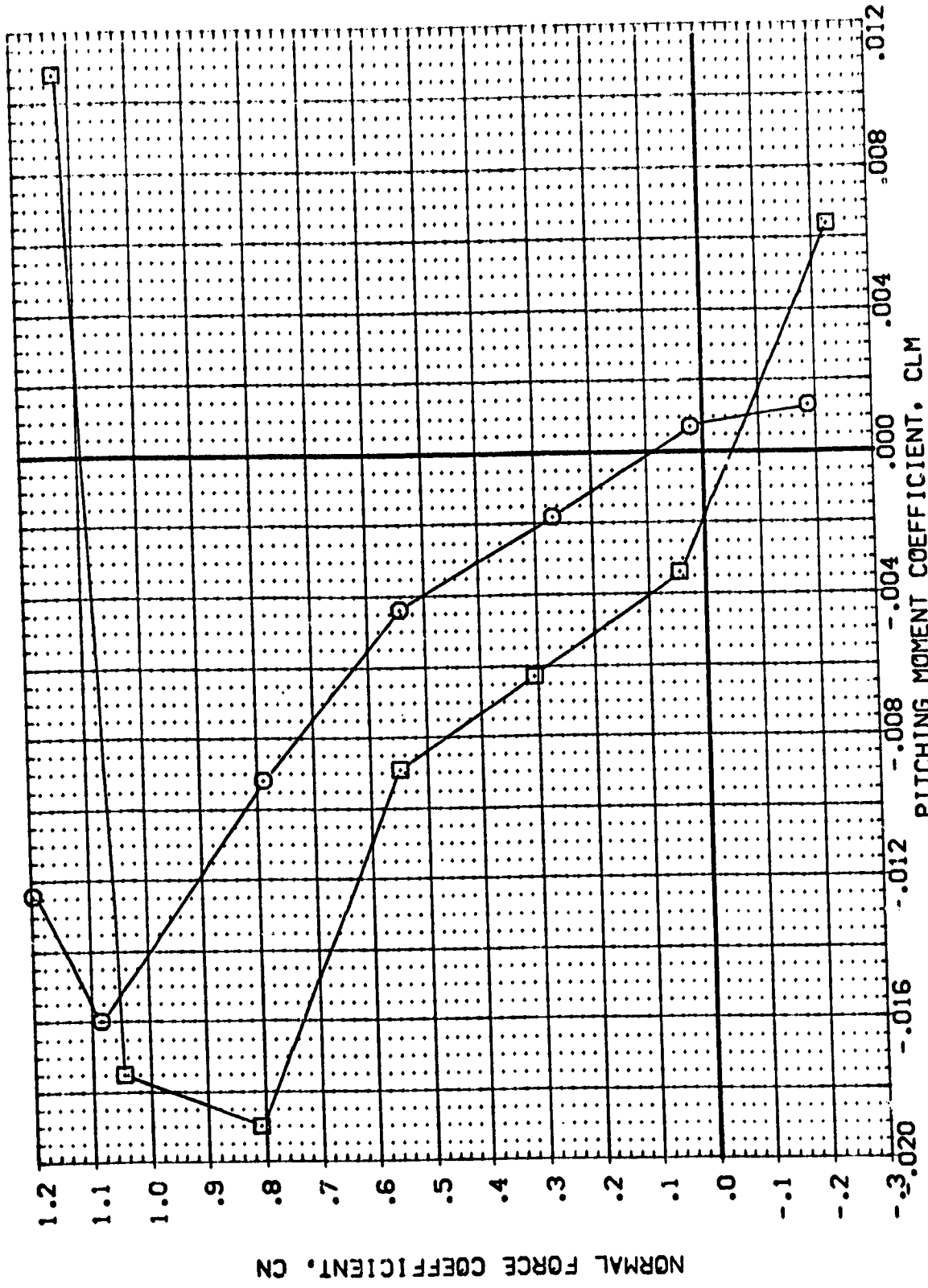


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



(RBPO01)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		REFERENCE INFORMATION	
		BETA	RUDDER	ELEVON	RUDFLR
○	.600	.000	.000	.000	.000
□	.905	.000	.000	.000	.000

SREF	2.4210	SQ.FT.
LREF	39.8450	IN.
BREF	39.8450	IN.
XMRP	32.3000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	SCALE

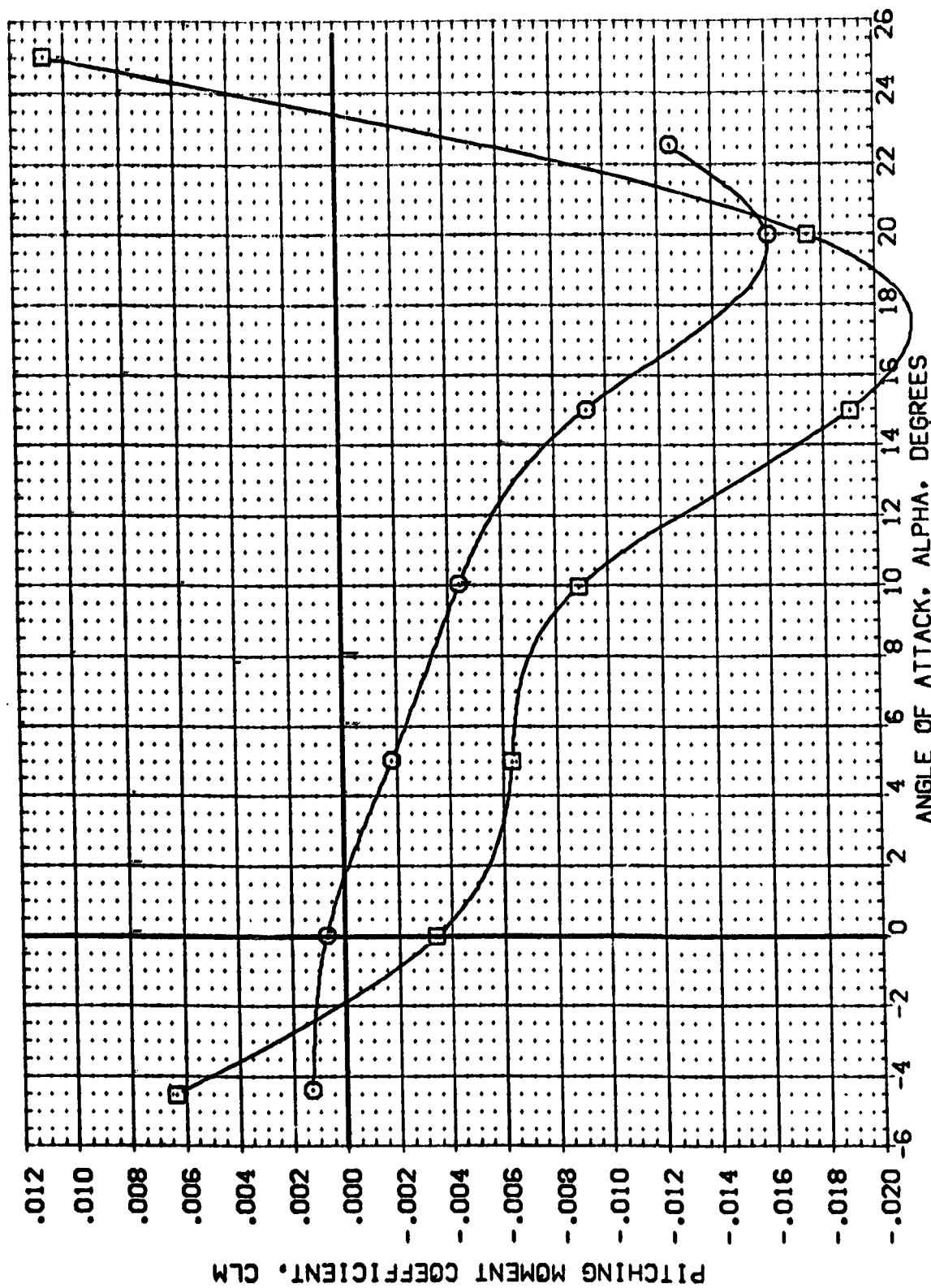


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



(RBP0001)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		BETA	ELEVON RUOFLR
○	.600	.000	.000
□	.905	.000	.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 38.8490
 BREF 38.8490
 XGRP 32.3000
 YGRP .0000
 ZGRP .0000
 SCALE .0300

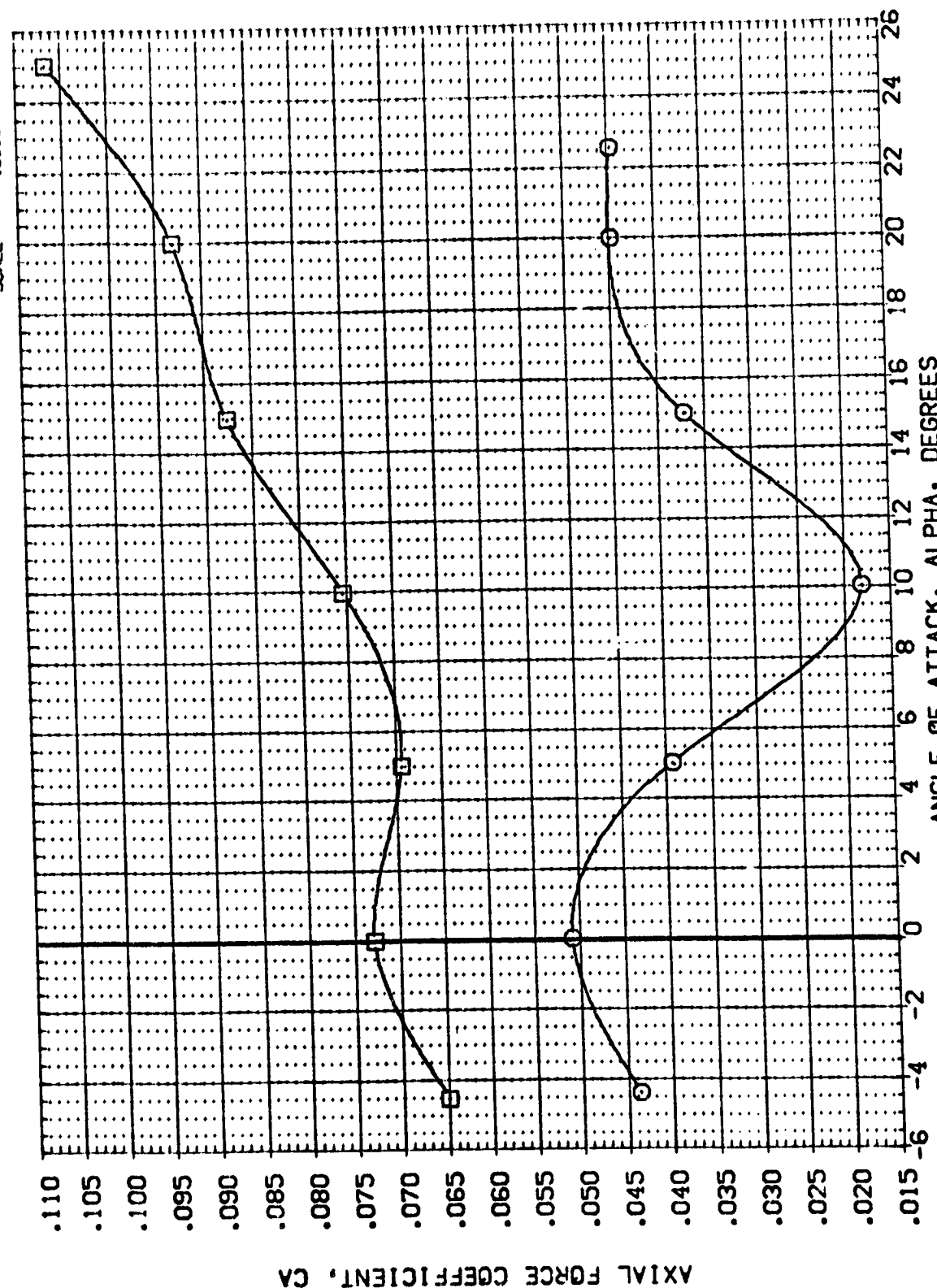


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



(RBP001)

AMES 11-707 0A12 02A

SYMBOL	MACH	BETA	RUDDER	PARAMETRIC VALUES	ELEVON	RUDDLR
○	.600	.000	.000	.000	.000	.000
□	.905	.000	.000	.000	.000	.000

REFERENCE INFORMATION

REF	2.4210	SG.FT.
REF	29.8490	IN.
REF	29.8490	IN.
REF	22.3000	IN.
REF	.0000	IN.
REF	.0000	IN.
REF	.0300	SCALE

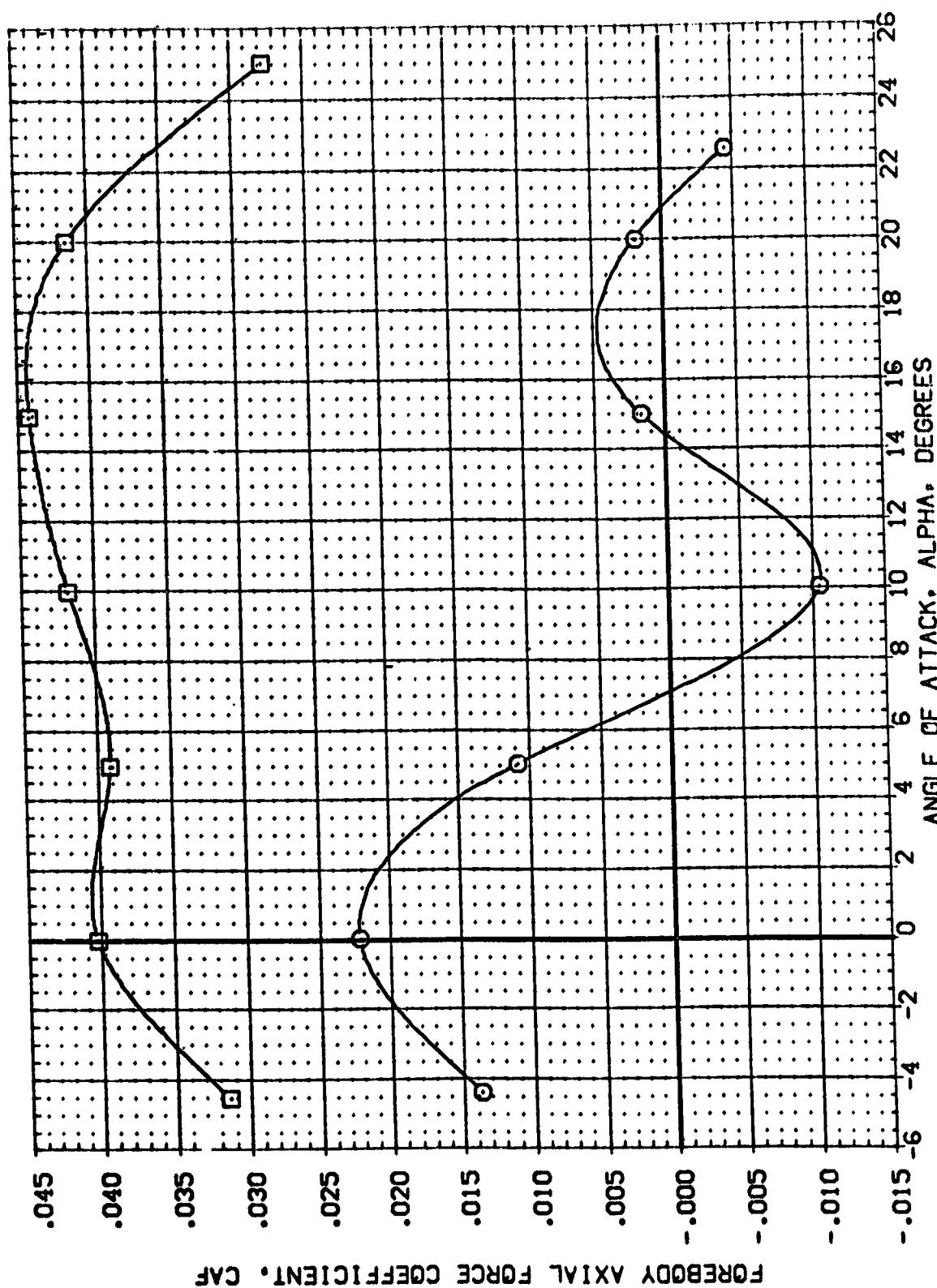


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



(ABP001)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		BETA	ELEVON
○	.600	.000	.000
□	.905	.000	.000

REFERENCE INFORMATION

SREF	2.4210	SG.FT.
LREF	39.8490	IN.
BREF	38.8490	IN.
XGRP	32.3000	IN.
YGRP	.0000	IN.
ZGRP	.0000	IN.
SCALE	.0300	SCALE

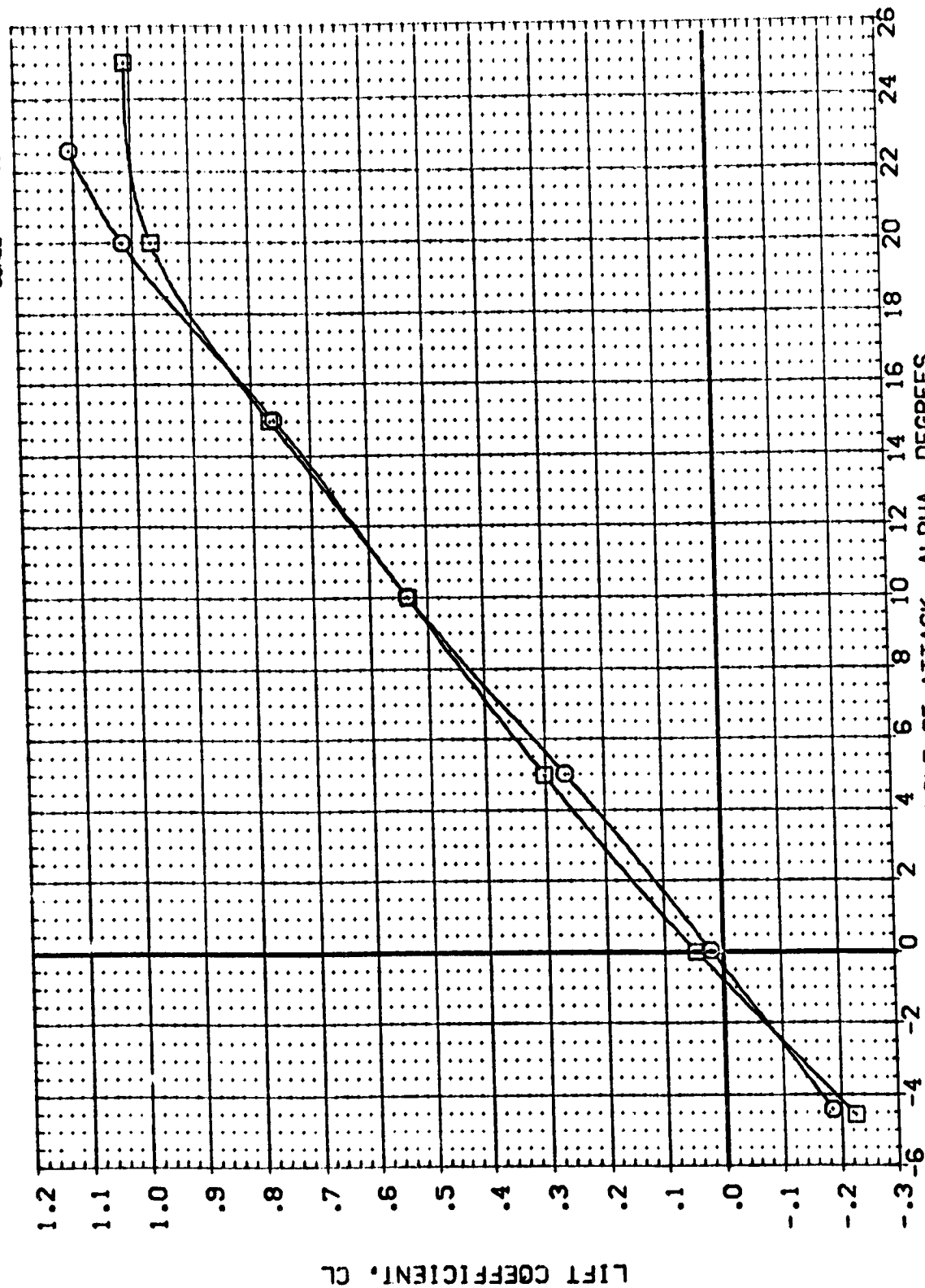


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



AMES 11-707 0A12 02A

(ABP001)

SYMBOL
□

MACH
.600
.905

PARAMETRIC VALUES
BETA .000
RUDDER .000
ELEVON .000
RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

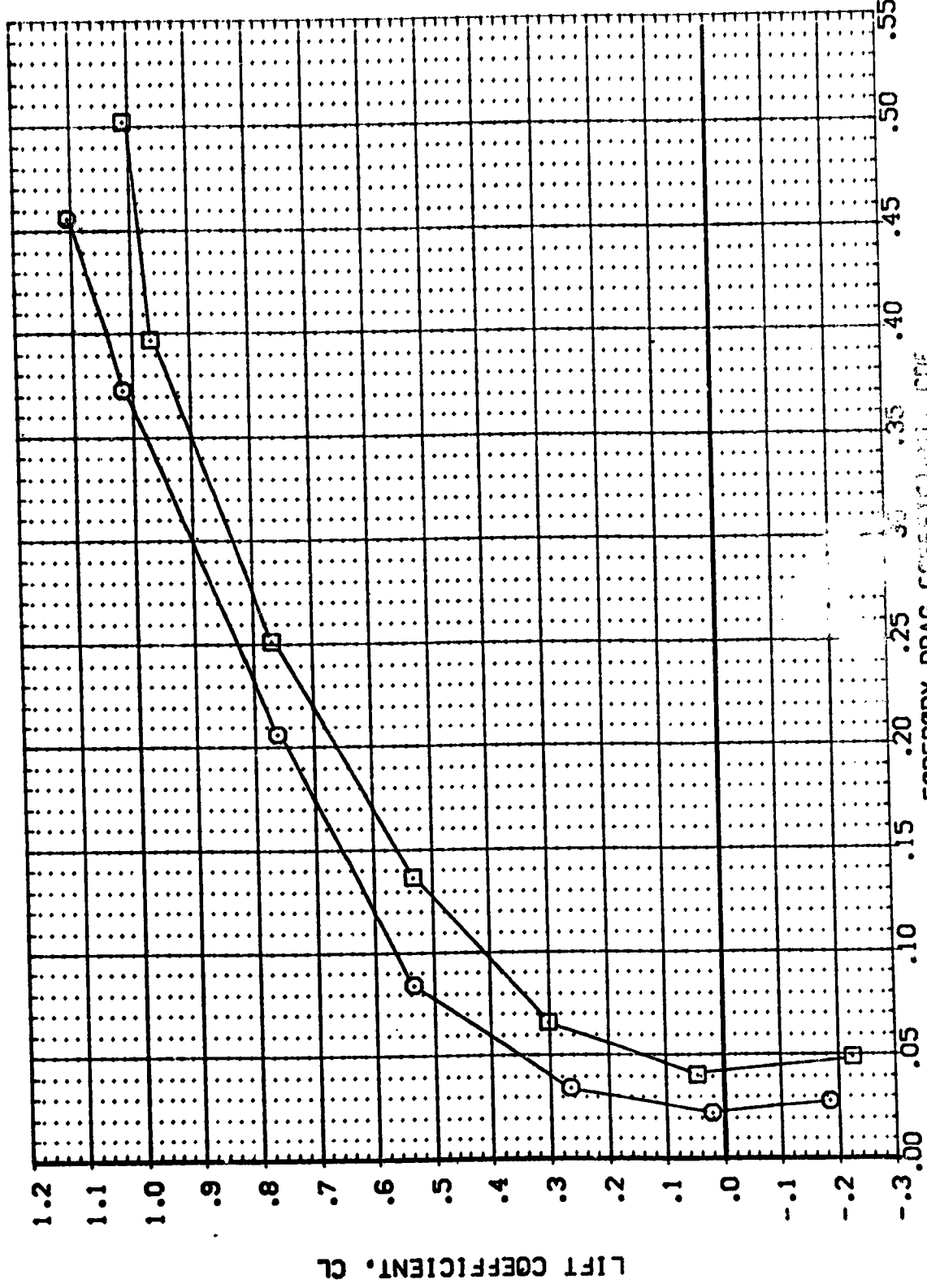


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MACH=0.600,0.905

==

(ABF 001)

AMES 11-707 0A12 02A

SYMBOL MACH BETA RUDDER
 ○ .600 .905
 □ .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 36.8490 IN.
 BREF 36.8490 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

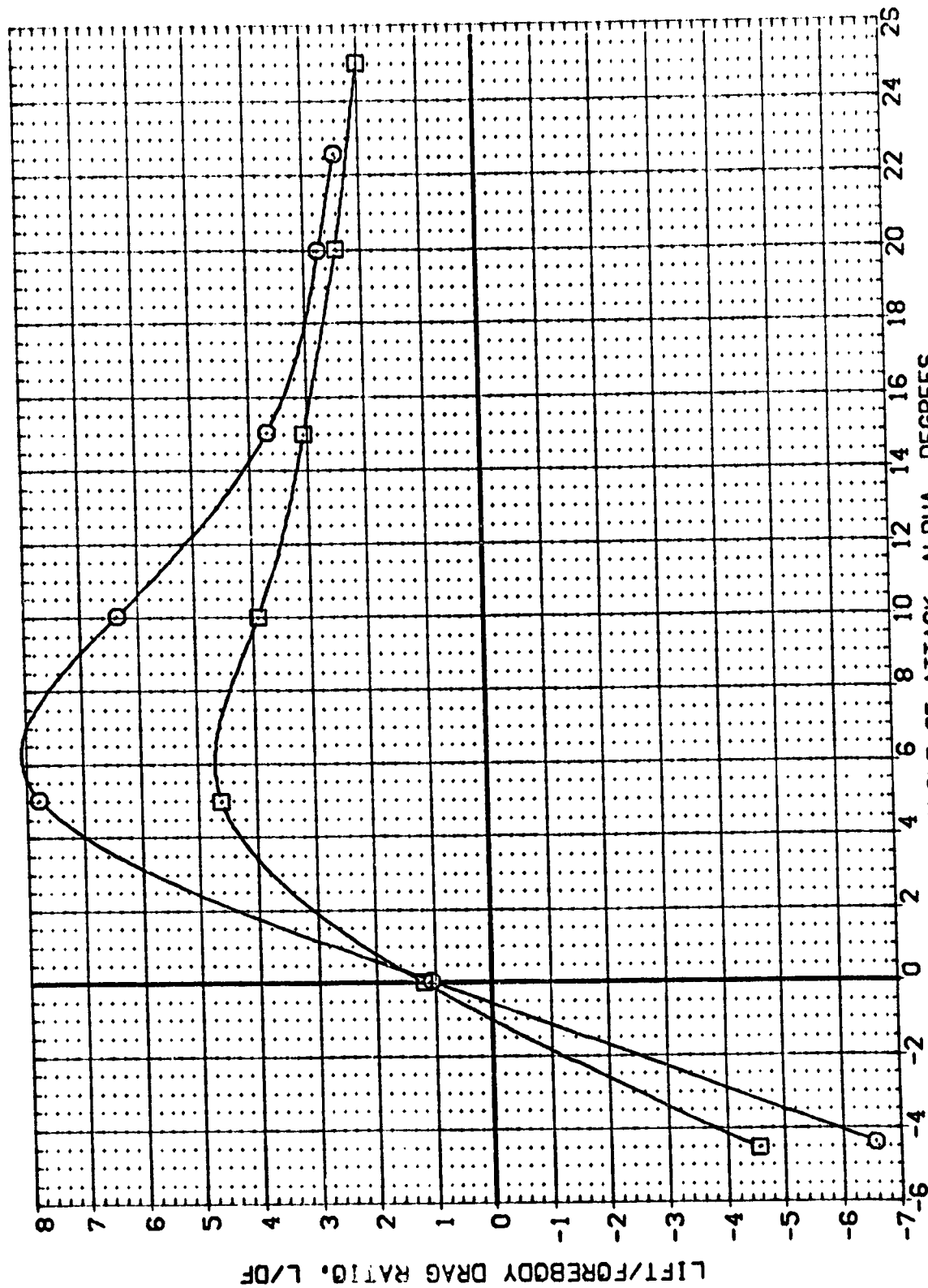


FIG.4 ORBITER LONGITUDINAL DATA AT BETA=0 DEGS., MN=0.600,0.905



AMES 11-707 0A12 02A

(RBP002)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
○	.598	RUDDER	.000 ELEVON	SREF 2.4210 SQ.FT.
□	.904		.000 RUOFLR	LREF 39.8490 IN.
				PREF 39.8490 IN.
				WARP 32.3000 IN.
				WARP .0000 IN.
				WARP .0000 IN.
				SCALE .0300 IN.

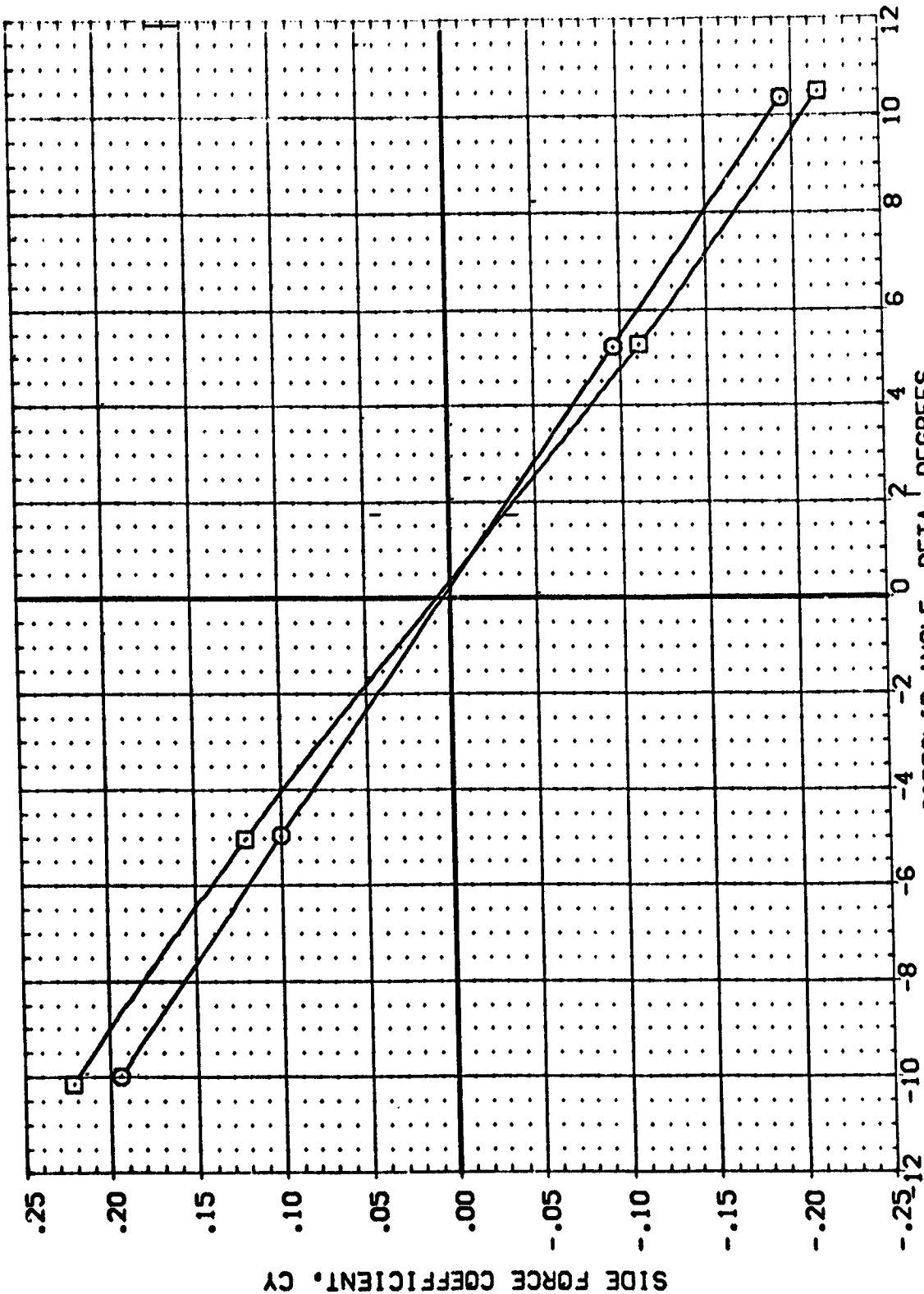


FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904

(RBP002)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		ALPHA	ELEVON
○	.598	.000	.000
□	.904	.000	.000

REFERENCE INFORMATION

	SD.FT.
SREF	2.4210
LREF	38.8450
BREF	38.8450
XGRP	32.3000
YGRP	.0000
ZGRP	.0000
SCALE	.0300

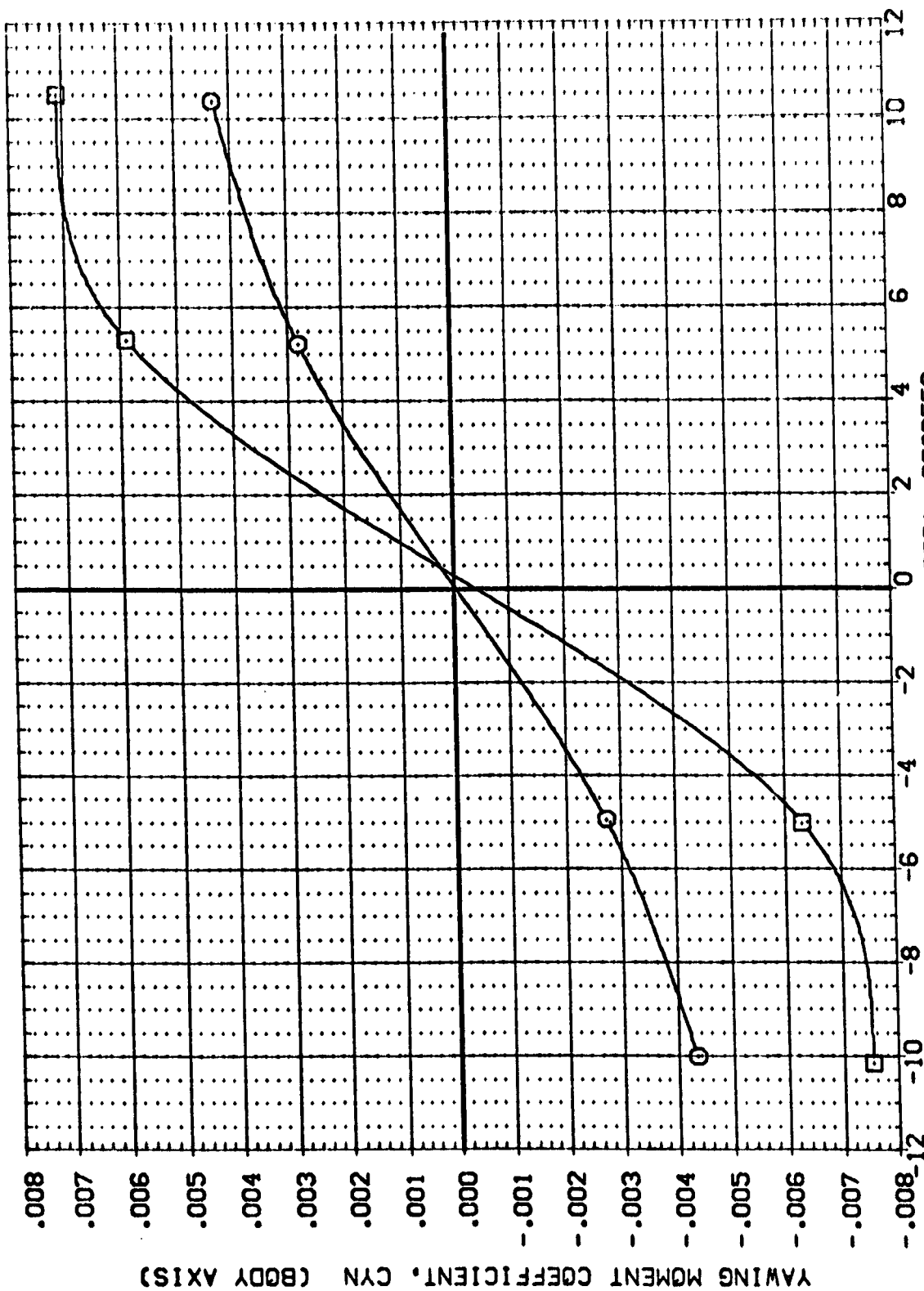


FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904



AMES 11-707 0A12 02A

(RBP002)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	.000
○ □	.598	RUDER	.000	RUDFLR	.000
	.504				

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8450
BREF	39.8450
YREF	32.3000
ZREF	0.0000
SCALE	.0000

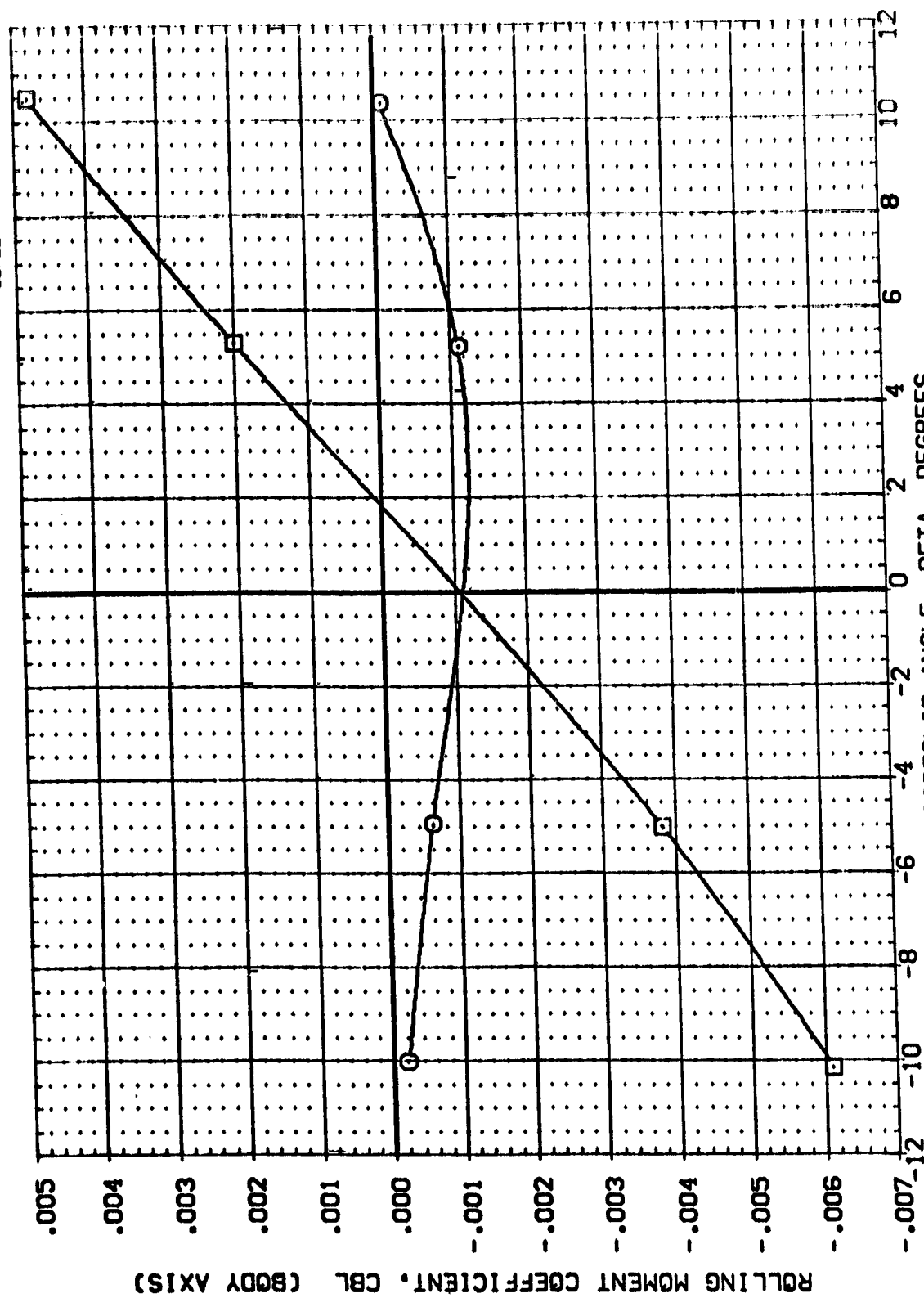


FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904



[RBPC002]

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	.000
□	.598	.000	RUDFLR	.000	
□	.904	.000			

REFERENCE INFORMATION

SIZE	2.4210
LINE	28.8450
REF	28.8450
XREF	28.8450
YREF	28.8450
ZREF	28.8450
SCALE	1.0000

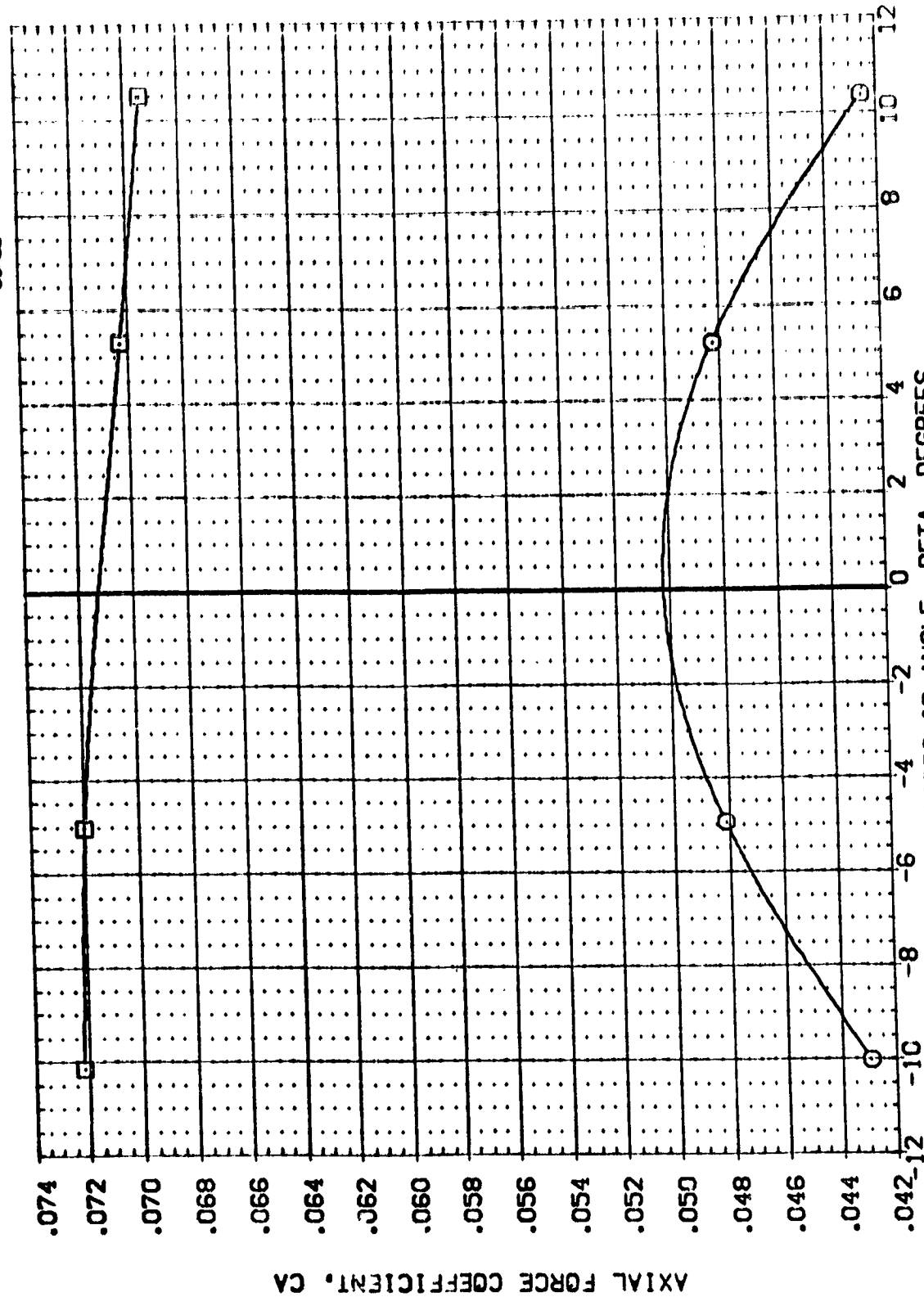


FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904



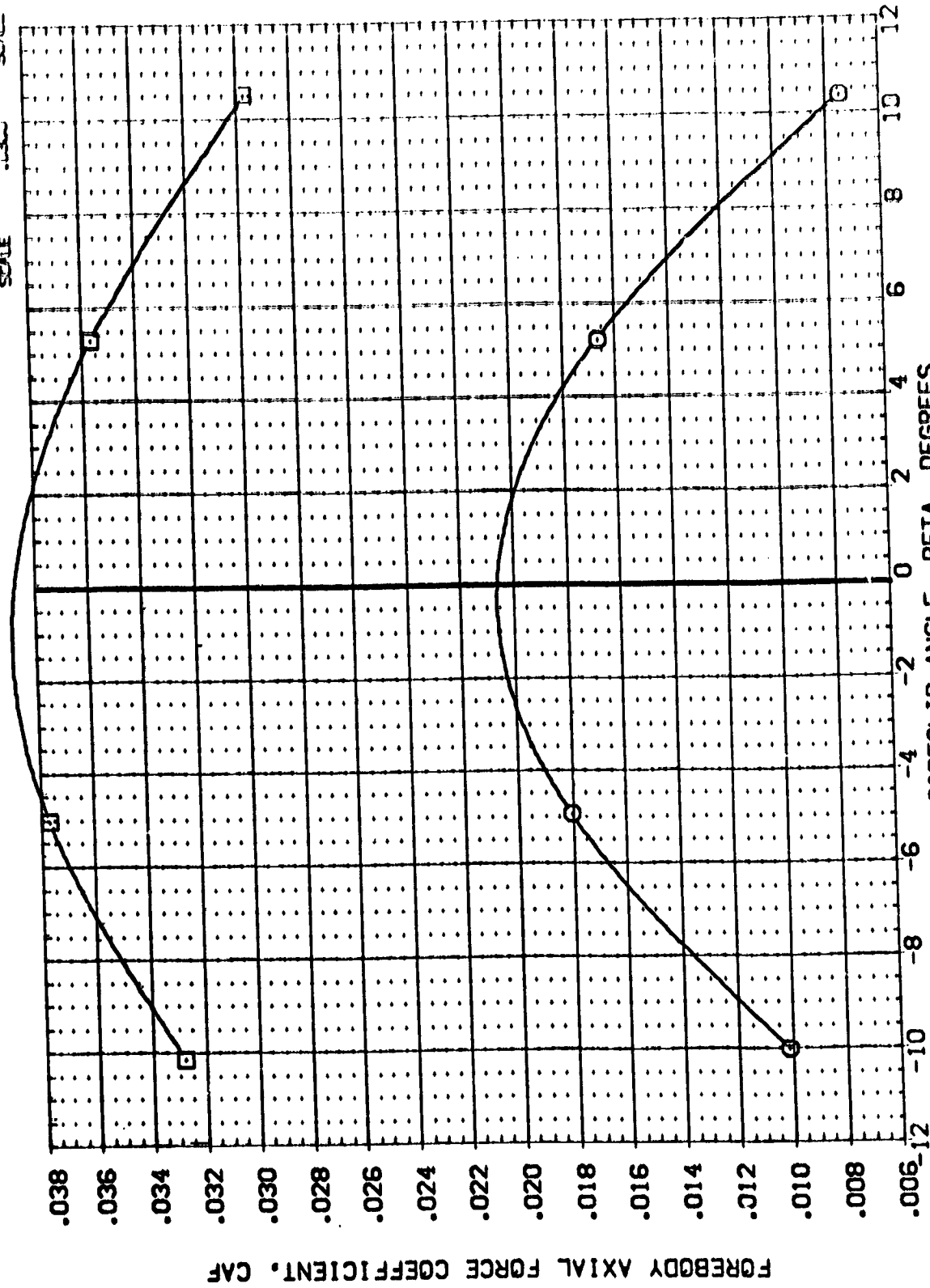
(RBP002)

AMES 11-707 0A12 02A

SYMBOL	MACN	ALPHA	PARAMETRIC VALUES	ELEVON	RUDELR
○	.598		.000	.000	.000
□	.904	RUDDER	.000		

REFERENCE INFORMATION

SREF	2.4210	SO.FT.
LREF	20.1850	IN.
BREF	20.1850	IN.
YREF	32.1000	IN.
XREF	32.1000	IN.
ZREF	32.1000	IN.
SCALE	1.000	SCALE



SIDESLIP ANGLE, BETA, DEGREES

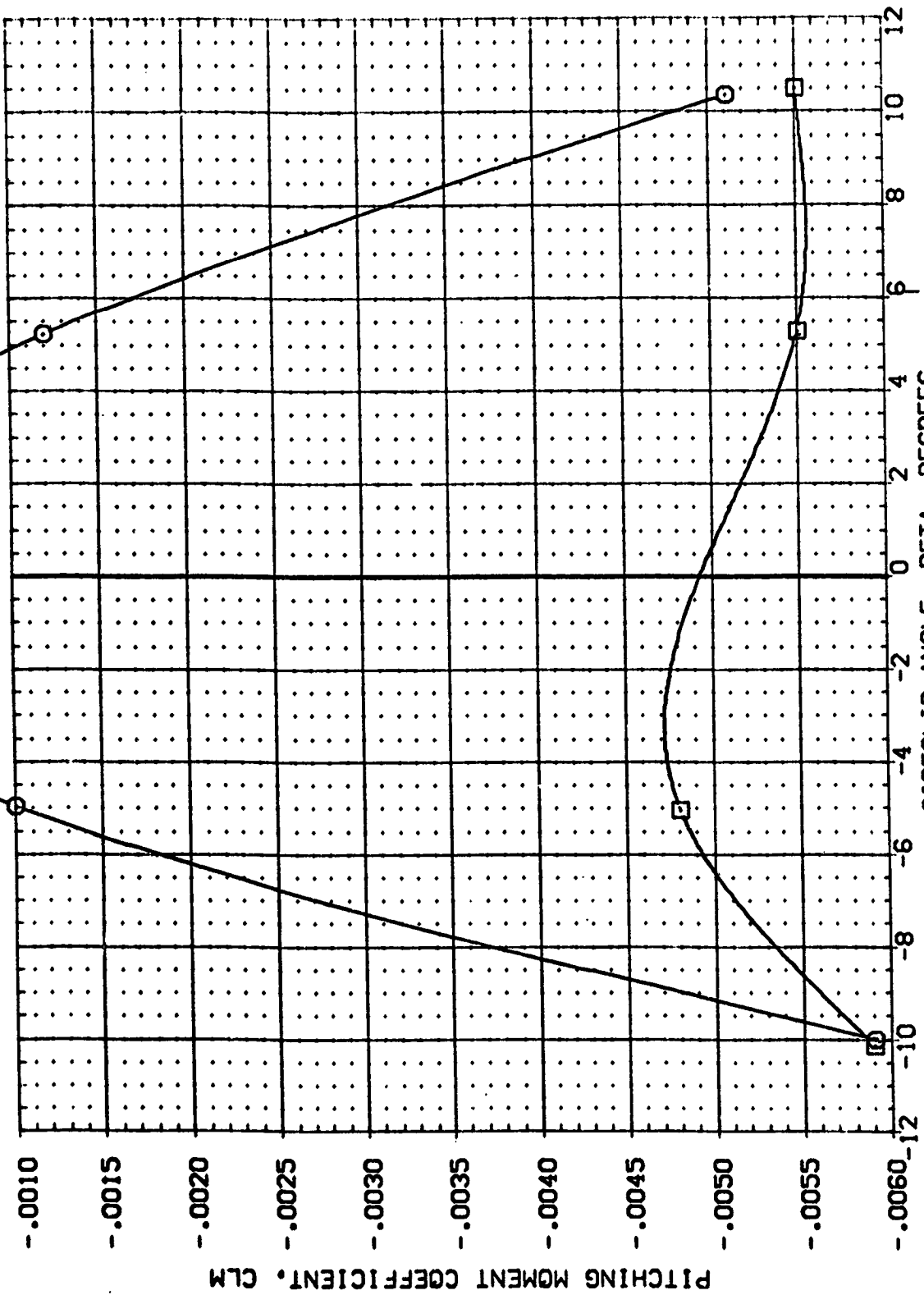
FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904

AMES 11-707 0A12 C2A

SYMBOL MACH ALPHA RUDDER
 O .598 .000 ELEVON
 □ .504 .000 RUOFLR

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 YPRP 32.3000 IN.
 ZPRP .0000 IN.
 SCALE .0300

(RBP002)



SIDSLIP ANGLE, BETA, DEGREES

FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904

(RBP002)

AMES 11-707 0A12 02A

SYMBOL
□

MACH
.598
.904

PARAMETRIC VALUES
ALPHA
ELEVON
RUDDER
.000
.000
.000

REFERENCE INFORMATION
SREF 2.6210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300
SQ.FT. SCALE

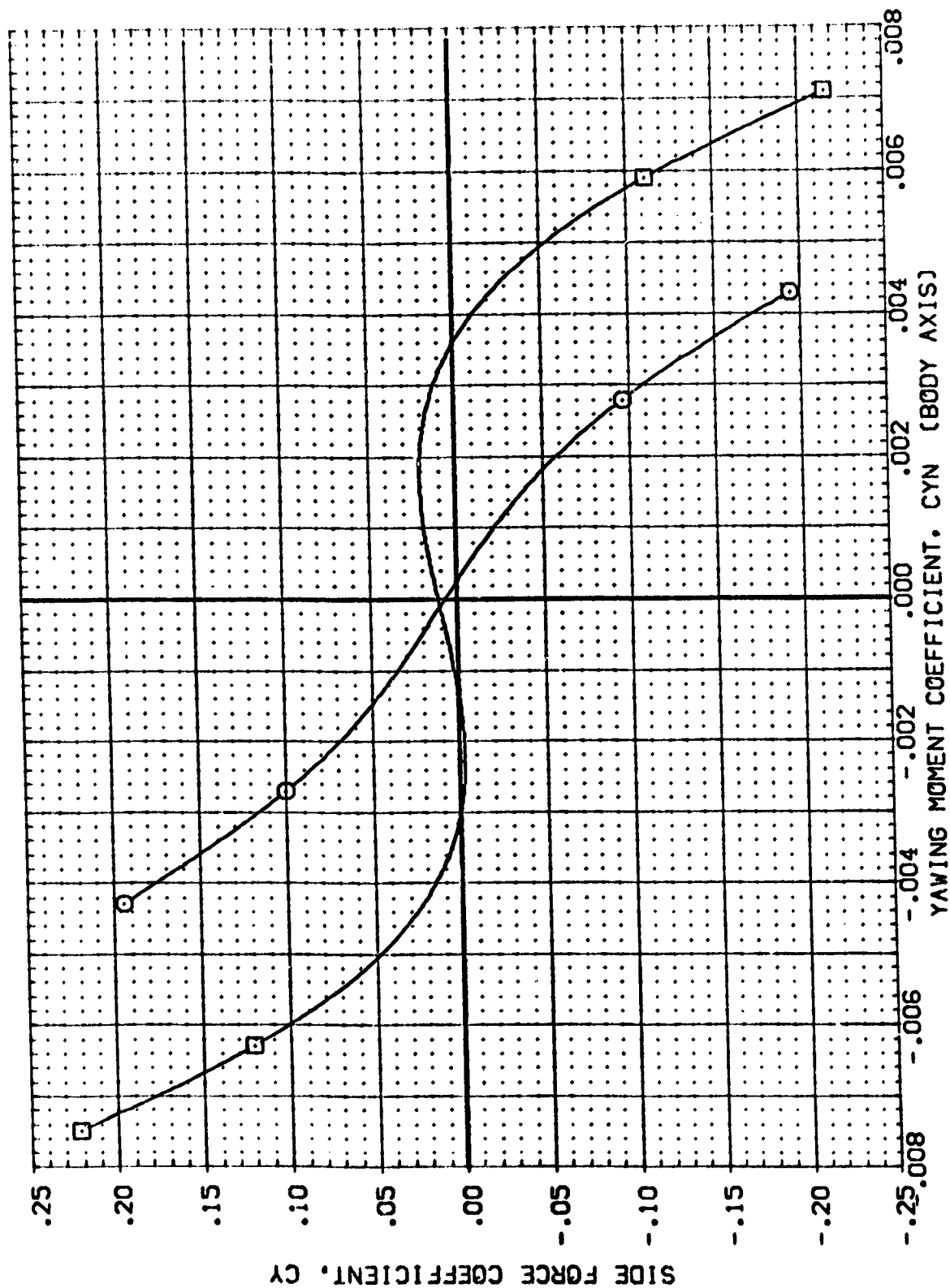


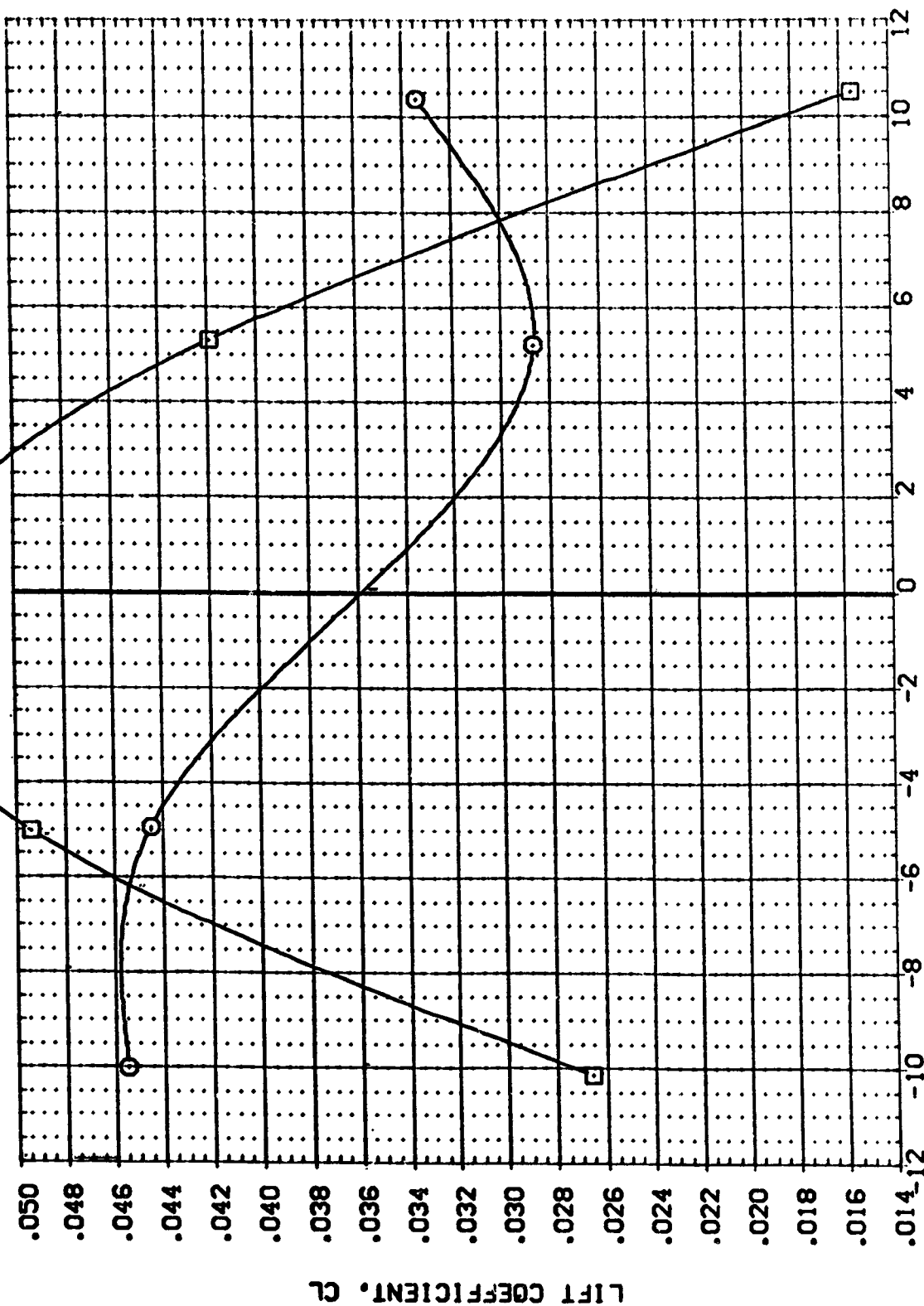
FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904



AMES 11-707 0A12 02A

(ABP002)

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION			
		ALPHA	ELEVON	RUOFLR	SREF	2.4210	SG.FT.	
○	.598	.000	.000	.000	LREF	28.8490	IN.	
□	.904	.000	.000	.000	BREF	38.8490	IN.	
					XMRP	32.3000	IN.	
					YMRP	.0000	IN.	
					ZMRP	.0000	IN.	
					SCALE	.0300	SCALE	



SIDESLIP ANGLE, BETA, DEGREES

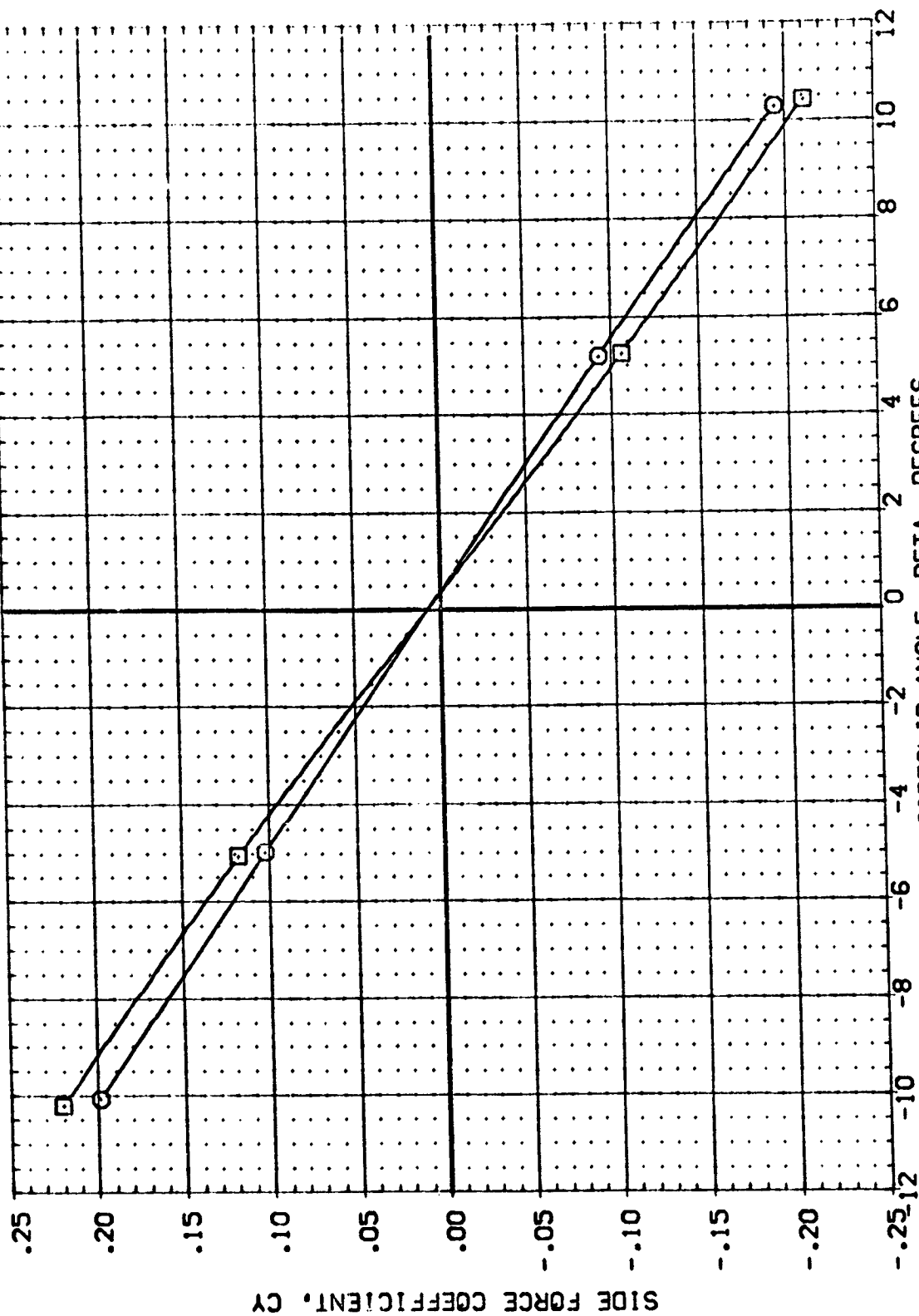
FIG.5 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=0 DEGS., MN=0.598,0.904

(R8P003)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDLR .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904



(RBPO03)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	.000
○	.596	RUDDER	5.000	RUDFLR	.000
□	.904				

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP 0.0000
 ZMRP 0.0000
 SCALE .0300

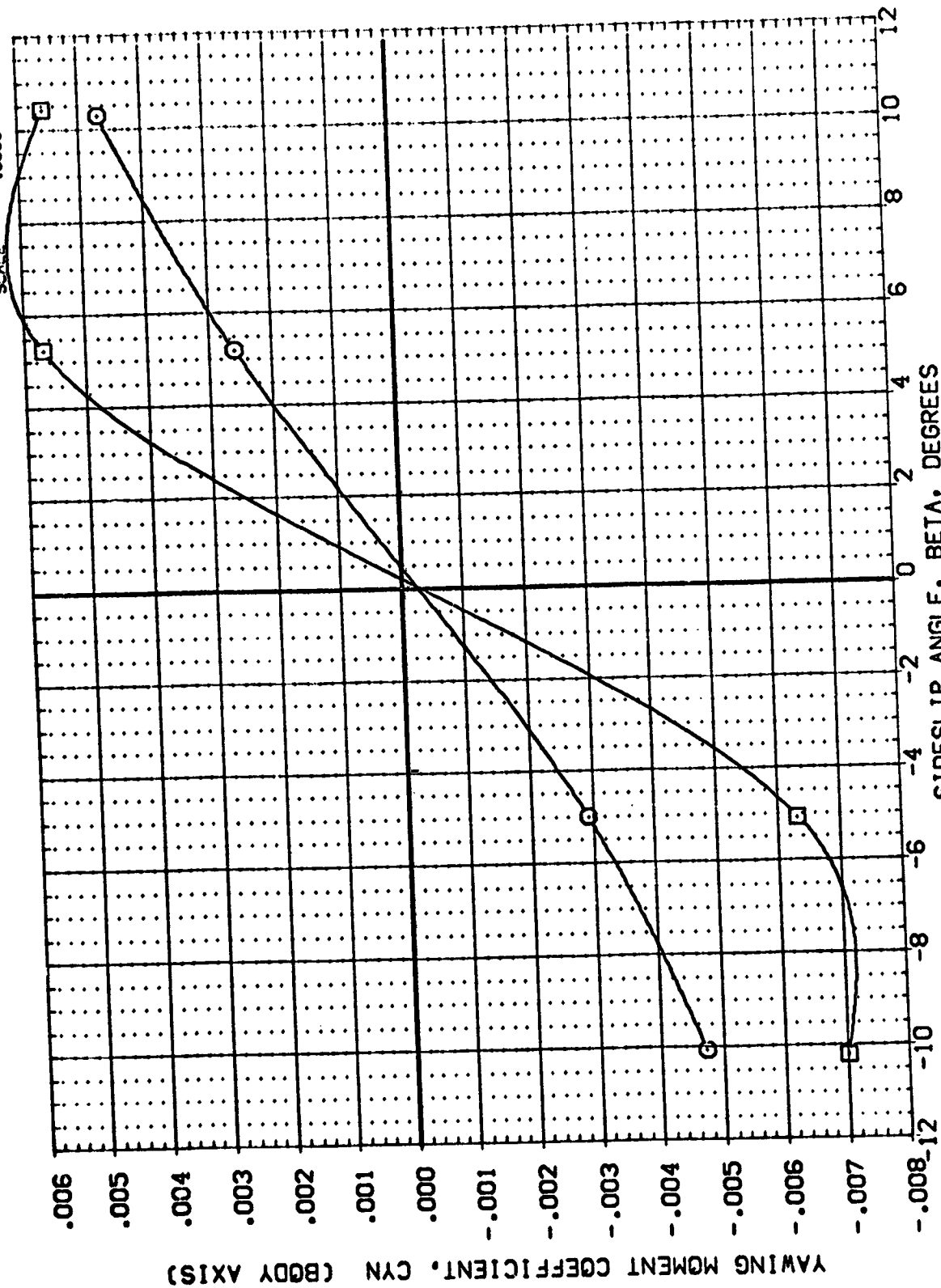


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904

(RBP003)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		REF	LREF	BREF	XMRP	YMRP	ZMRP	SCALE	REFERENCE INFORMATION	SQ.FT.
		ALPHA	ELEVON									
○	.596	5.000	.000	.000								
□	.904	.000	.000	.000								

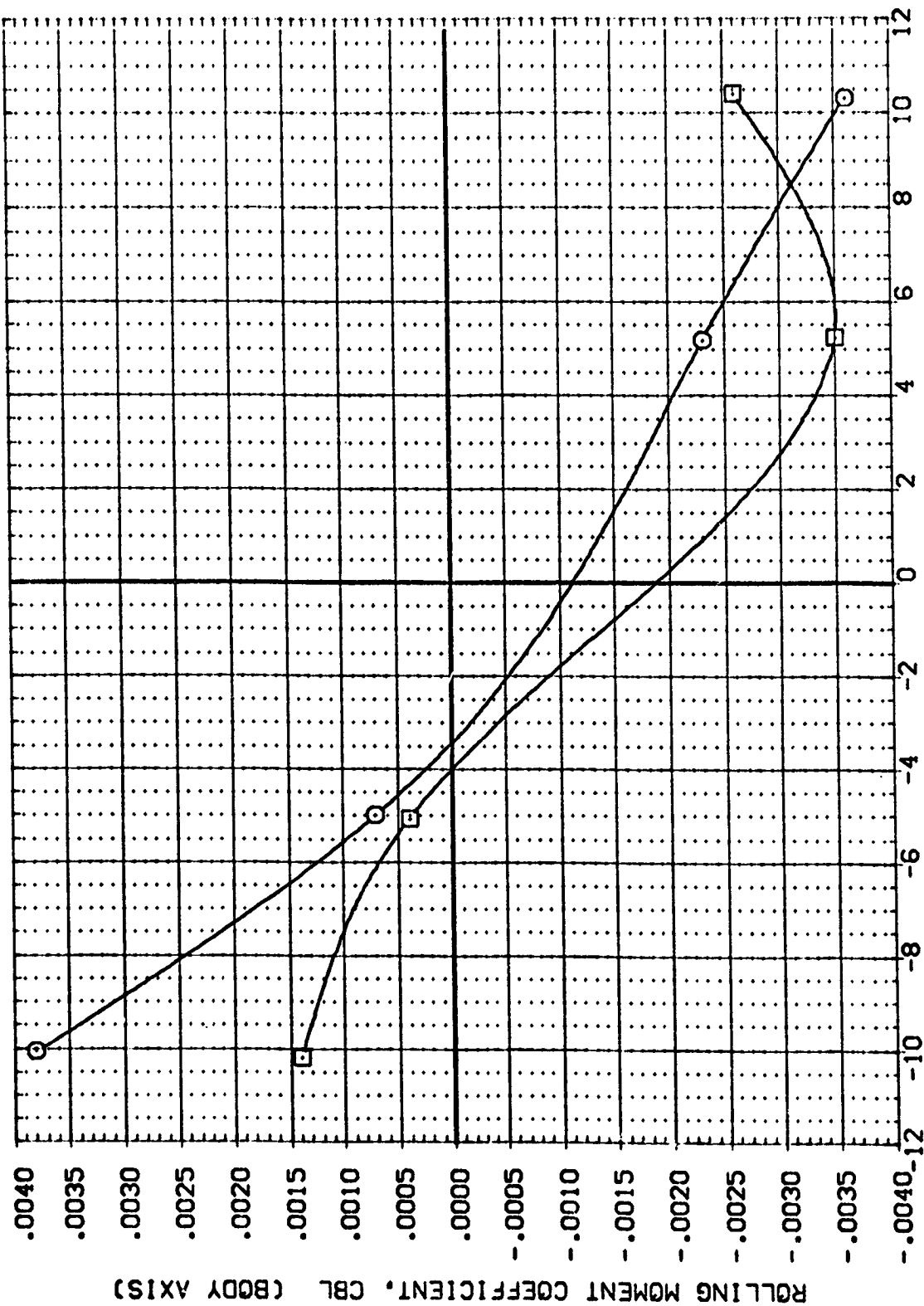


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904

(RBP003)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .596 .904 .000 .000
○ 5.000 ELEVON RUDDER .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.8490 IN.
BREF 38.8490 IN.
XVRP 32.3000 IN.
YVRP .0000 IN.
ZVRP .0000 IN.
SCALE .0300

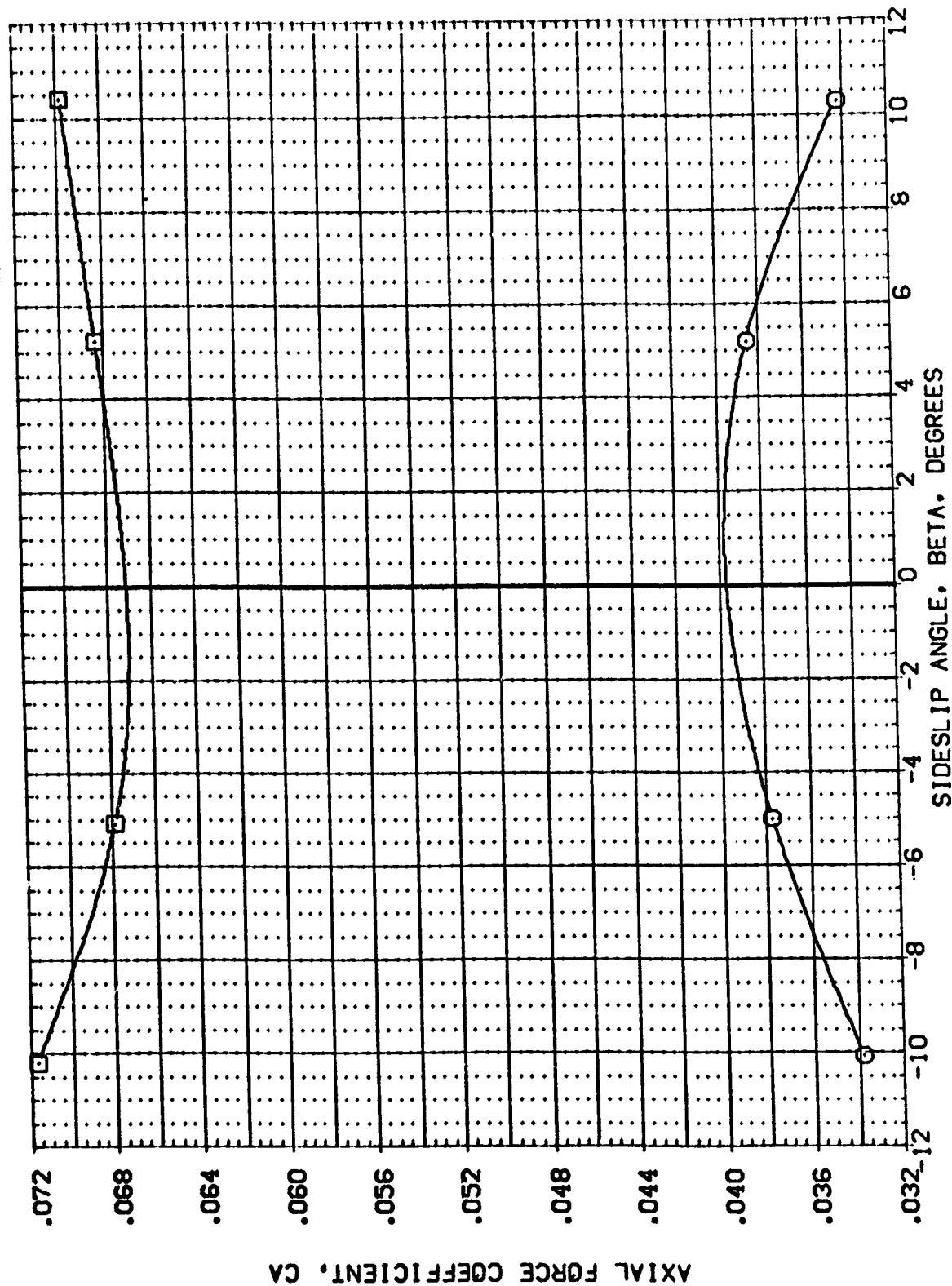


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904

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(RBP003)

AMES 11-707 0A12 02A

SYMBOL
□

MACH .596
.934
ALPHA 5.000
RUDGED .000
ELEVON .000
RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRD 32.3000
YMRD .0000
ZMRD .0000
SCALE .0300

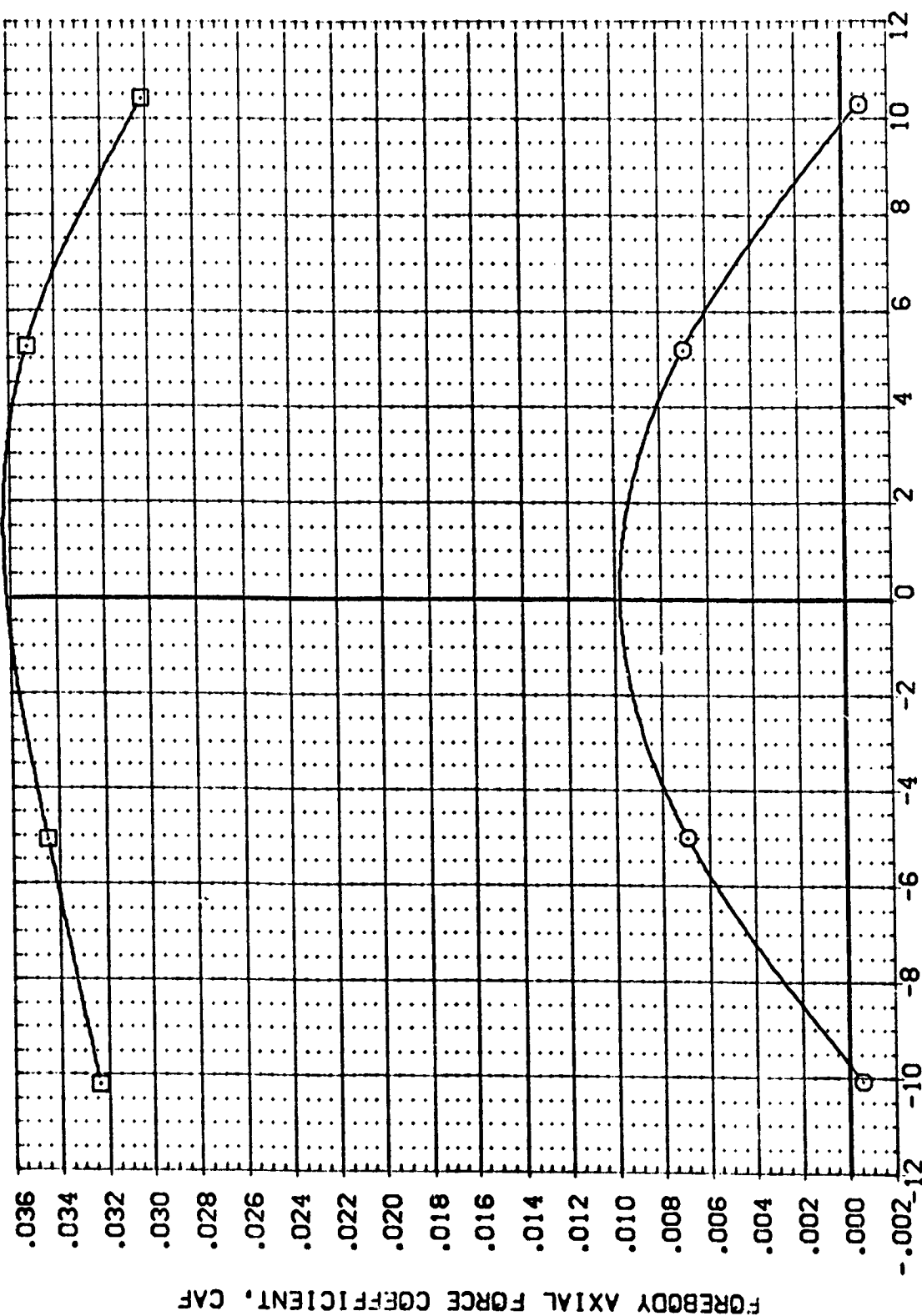


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904



AMES 11-707 0A12 02A

(RBP003)

SYMBOL	MACH	PARAMETRIC VALUES		REFERENCE INFORMATION
		ALPHA	ELEVON	
○	.596	.000	RUDFLR	SREF 2.4210 SQ.FT.
□	.504	.000	RUDFLR	LREF 39.8490 IN.
				BREF 39.8490 IN.
				VMRP 32.3000 IN.
				VMRP .0000 IN.
				ZMRP .0000 IN.
				SCALE .000

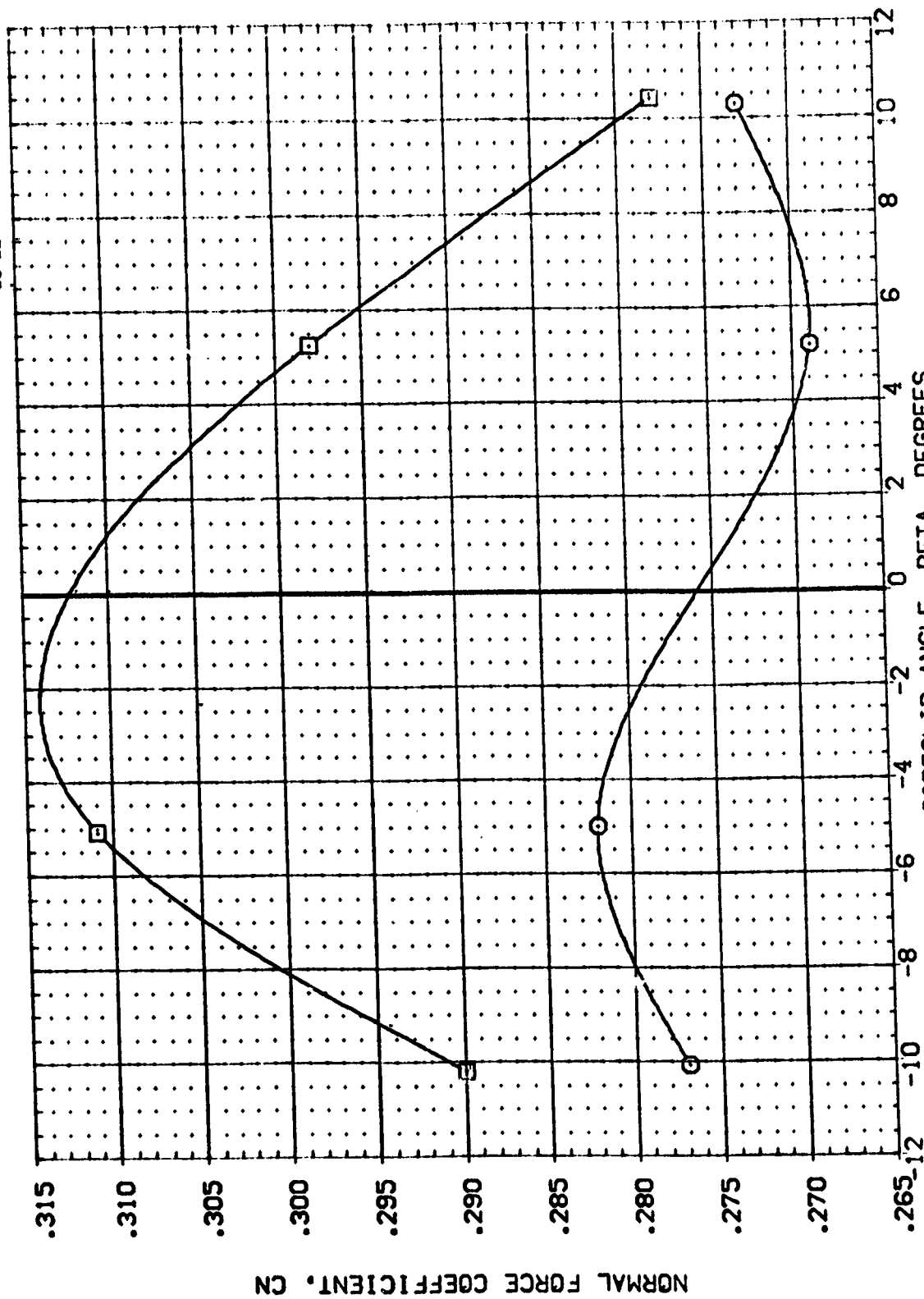


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904



(RBP003)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDFLR
○	.596	.904	5.000	.000	.000
□			.000		

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.5000
YMRP 0.0000
ZMRP 0.0000
SCALE 0.0300

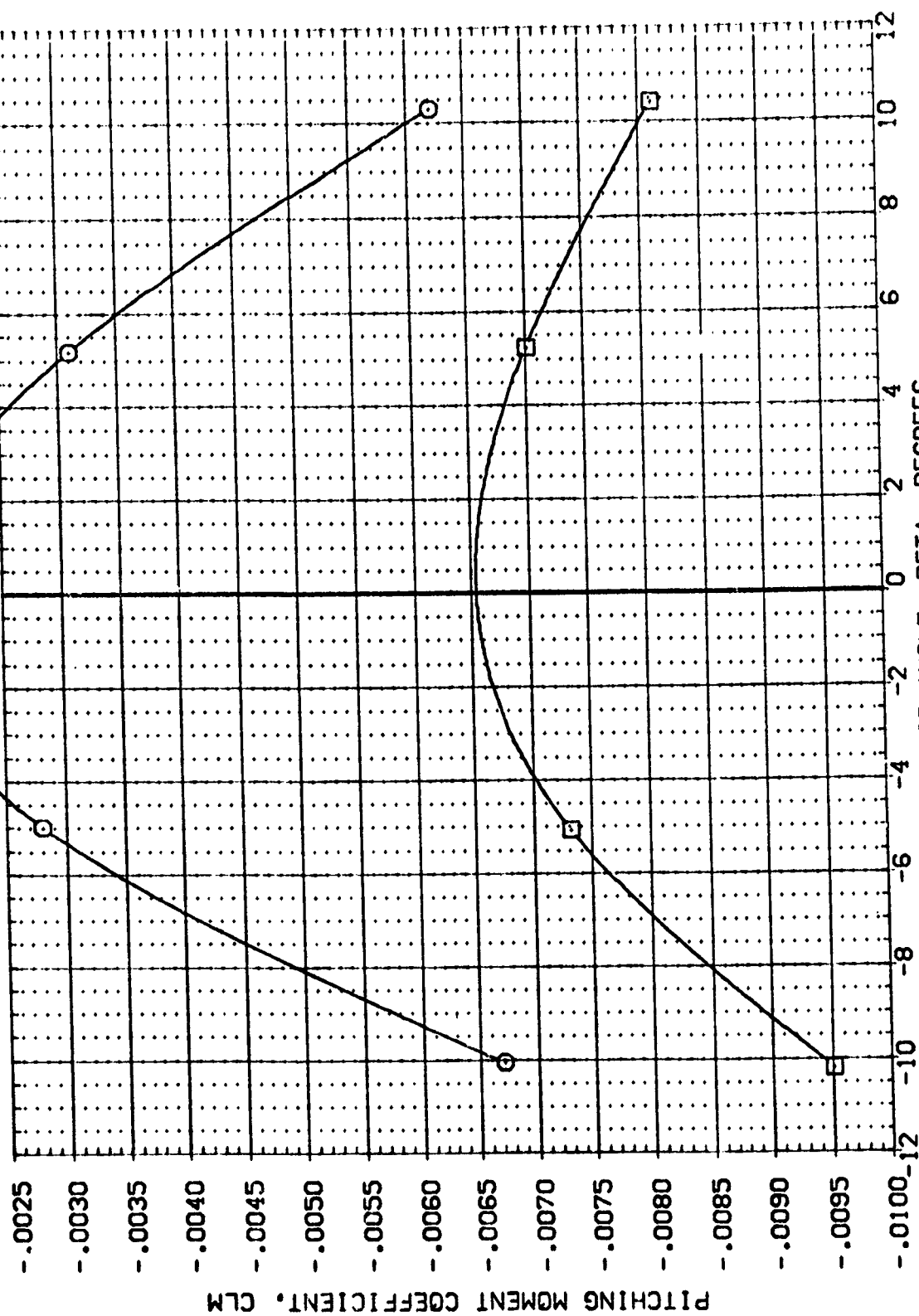


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904

(RBP003)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		ELEVON	RUDDER	CYN
		ALPHA	RUDDER			
□	.596	5.000	.000	.000	.000	.000
□	.904	.000	.000	.000	.000	.000

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 30.8400
 BREF 30.8400
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0000

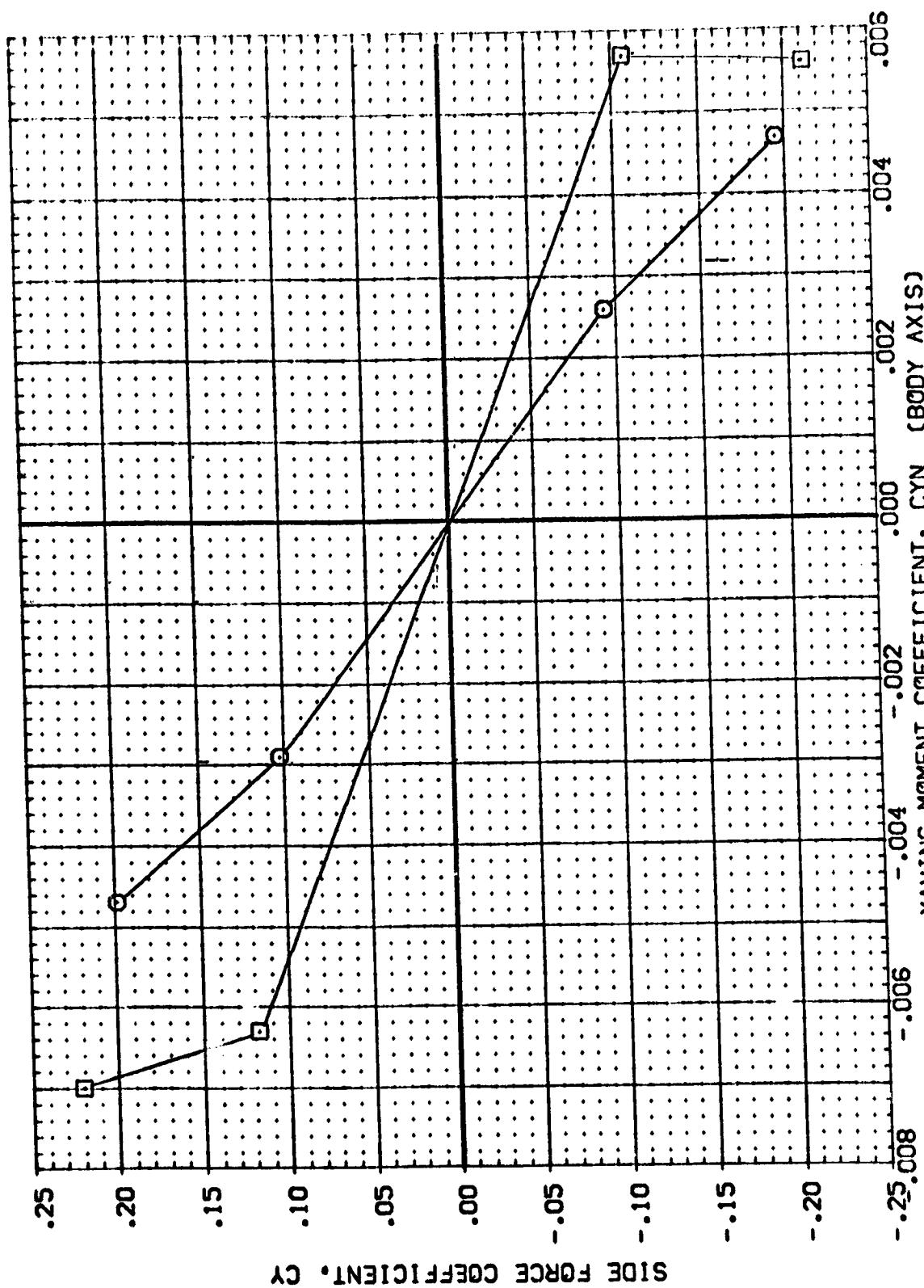


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596,0.904



(ABPCC3)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .566 .904
 □ 5.000 .000
 ELEVEN RLOFLR
 .000 .000

REFERENCE INFORMATION
 SREF 2.4210
 .REF 39.8490
 BREF 39.8490
 VREF 32.3000
 VREF 32.3000
 ZREF 32.3000
 SCALE 1.000

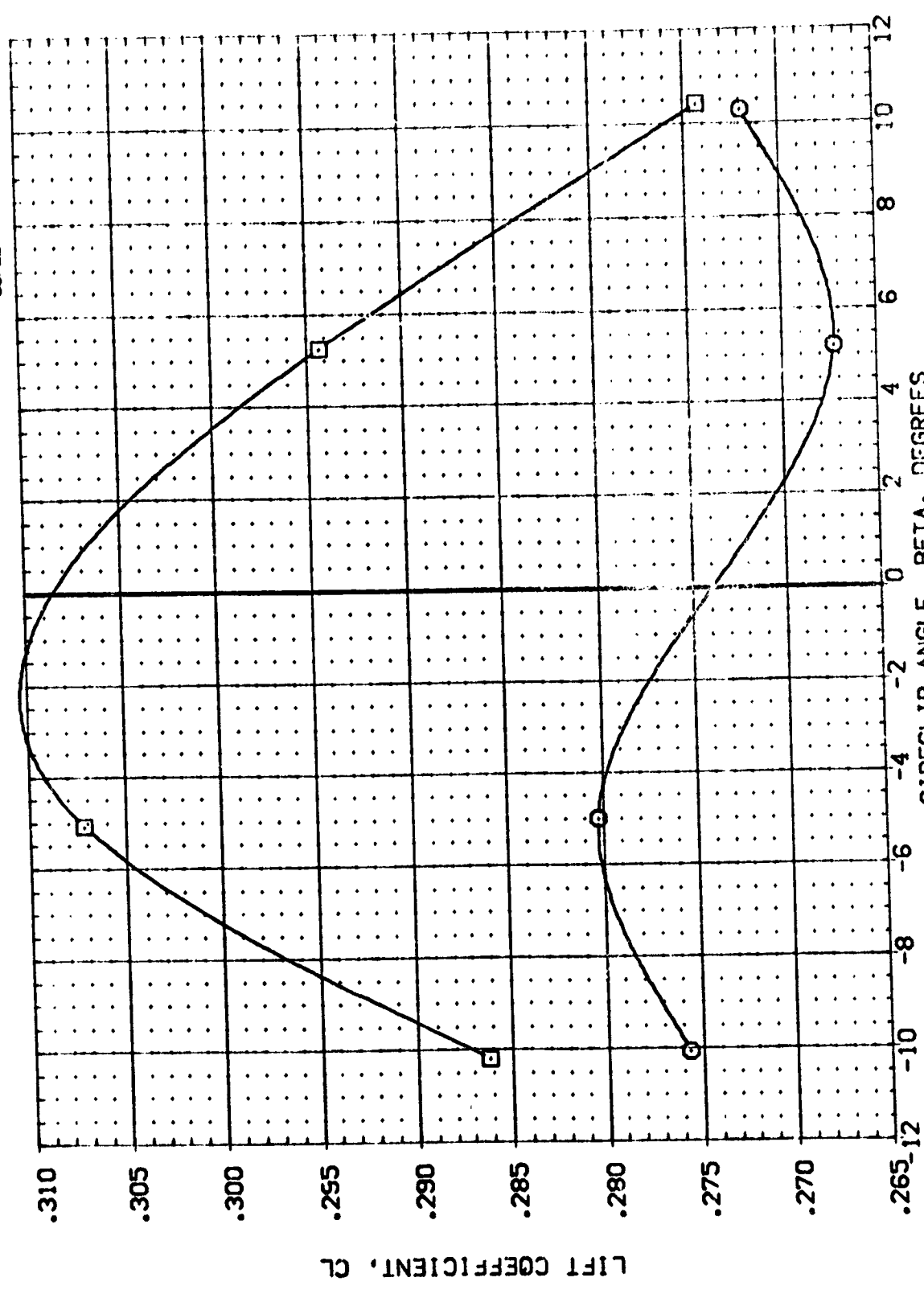


FIG.6 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=5 DEGS., MN=0.596, 0.904
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 26



(RBP004)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	ELEVON	.000
□	.597	.902		10.000	RUOFLR	.000

REFERENCE INFORMATION

SREF	2.4210	SC.FT.
LREF	39.8450	IN.
BREF	39.8450	IN.
XMRP	32.3000	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0000	SCALE

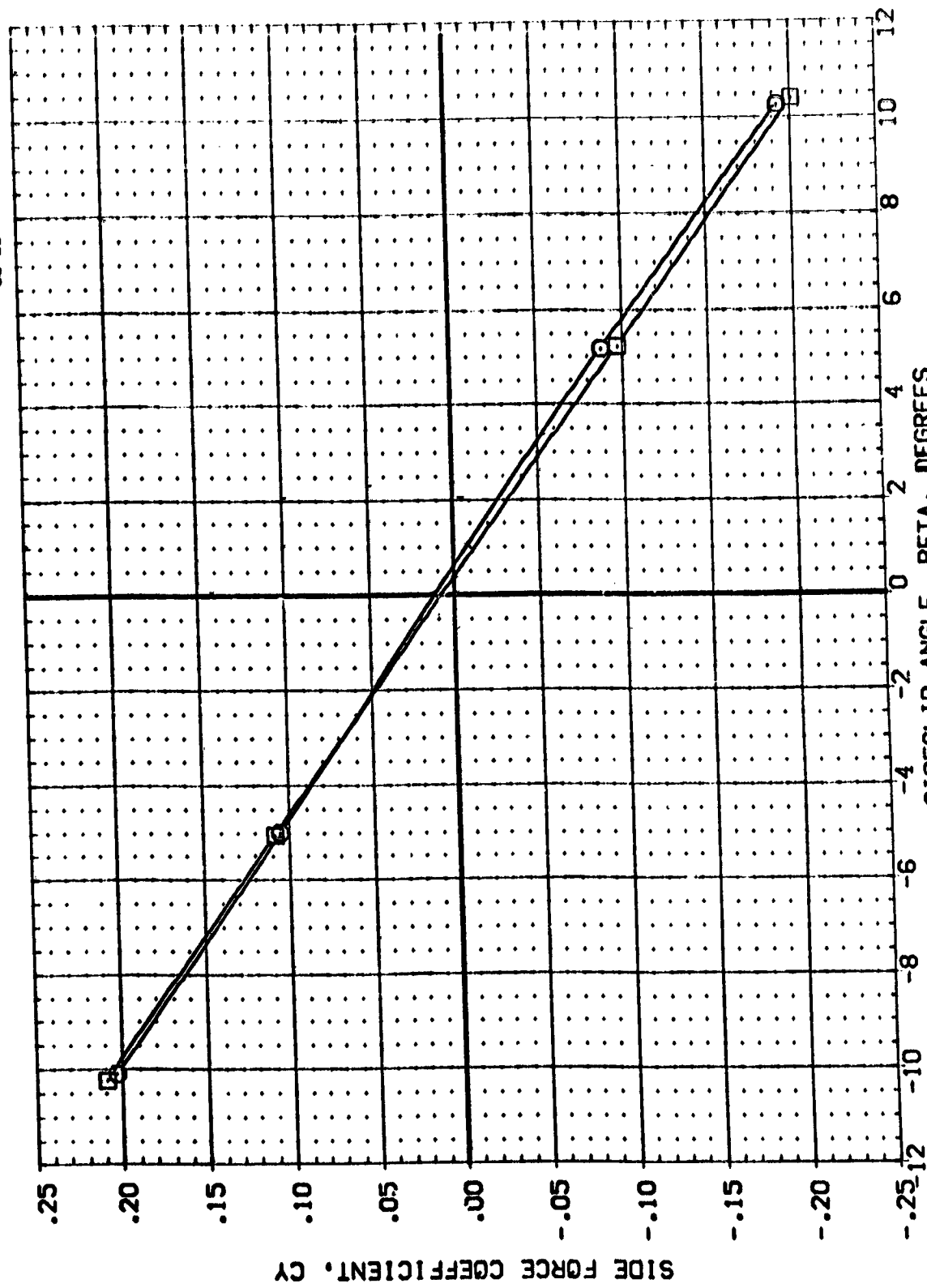


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597, 0.902

(RBP004)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 O .597 .000 .000 ELEVON
 □ .902 .000 .000 RUDDER

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.000

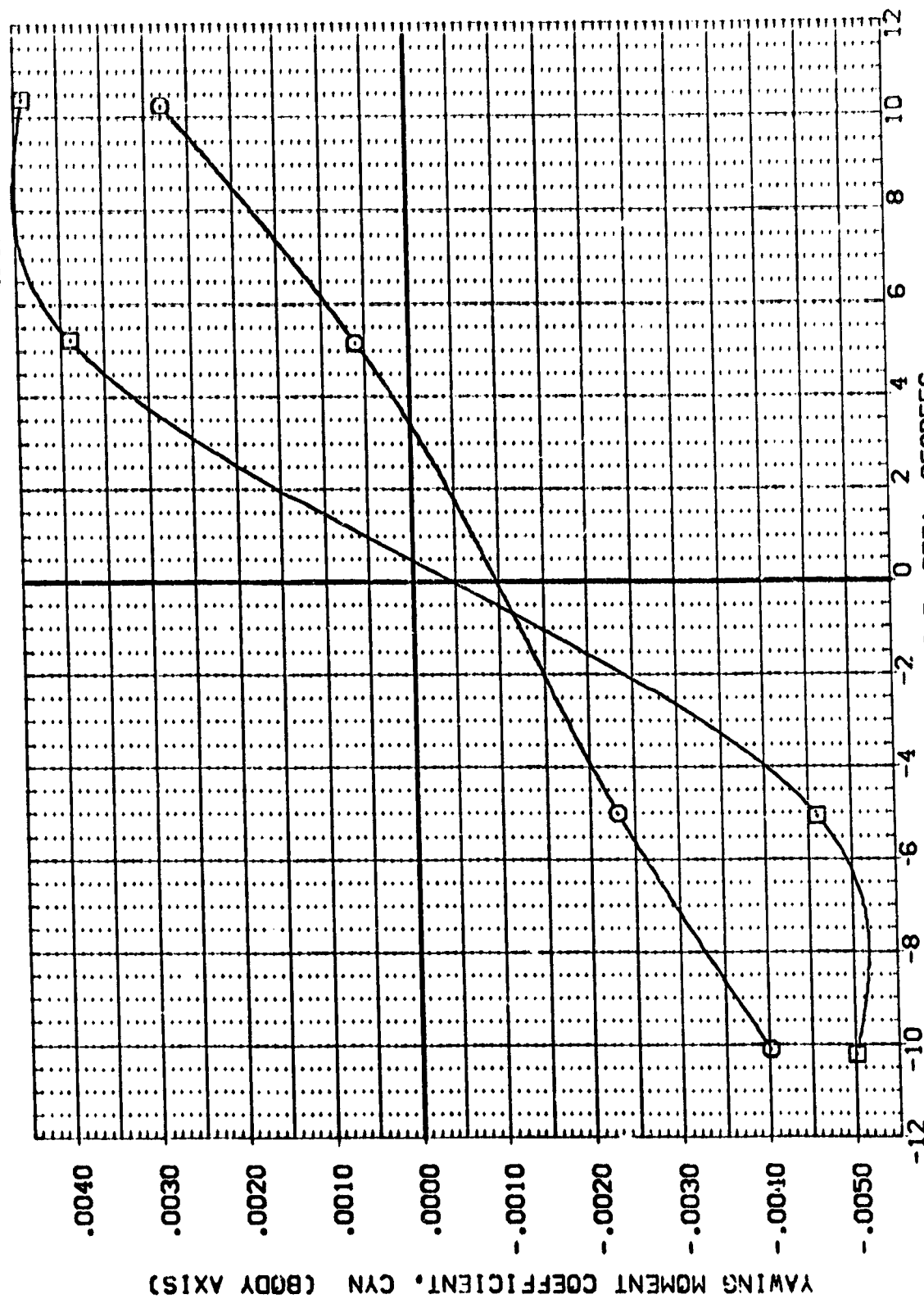


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597,0.902

AMES 11-707 0A12

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
BREF	32.8150
XREF	32.3000
YREF	0.0000
ZREF	0.0000
SCALE	1.0000
	50. FT.

SYMBOL	VAL	UNIT	PARAMETR	UNIT
○	.597	μPA	10.000	.000
□	.902	BUER	.000	.000

SYMBOL	MAC	PARAMETR:
<input checked="" type="checkbox"/>	.597	_PHA 10.000
<input type="checkbox"/>	.902	RUCCER .000

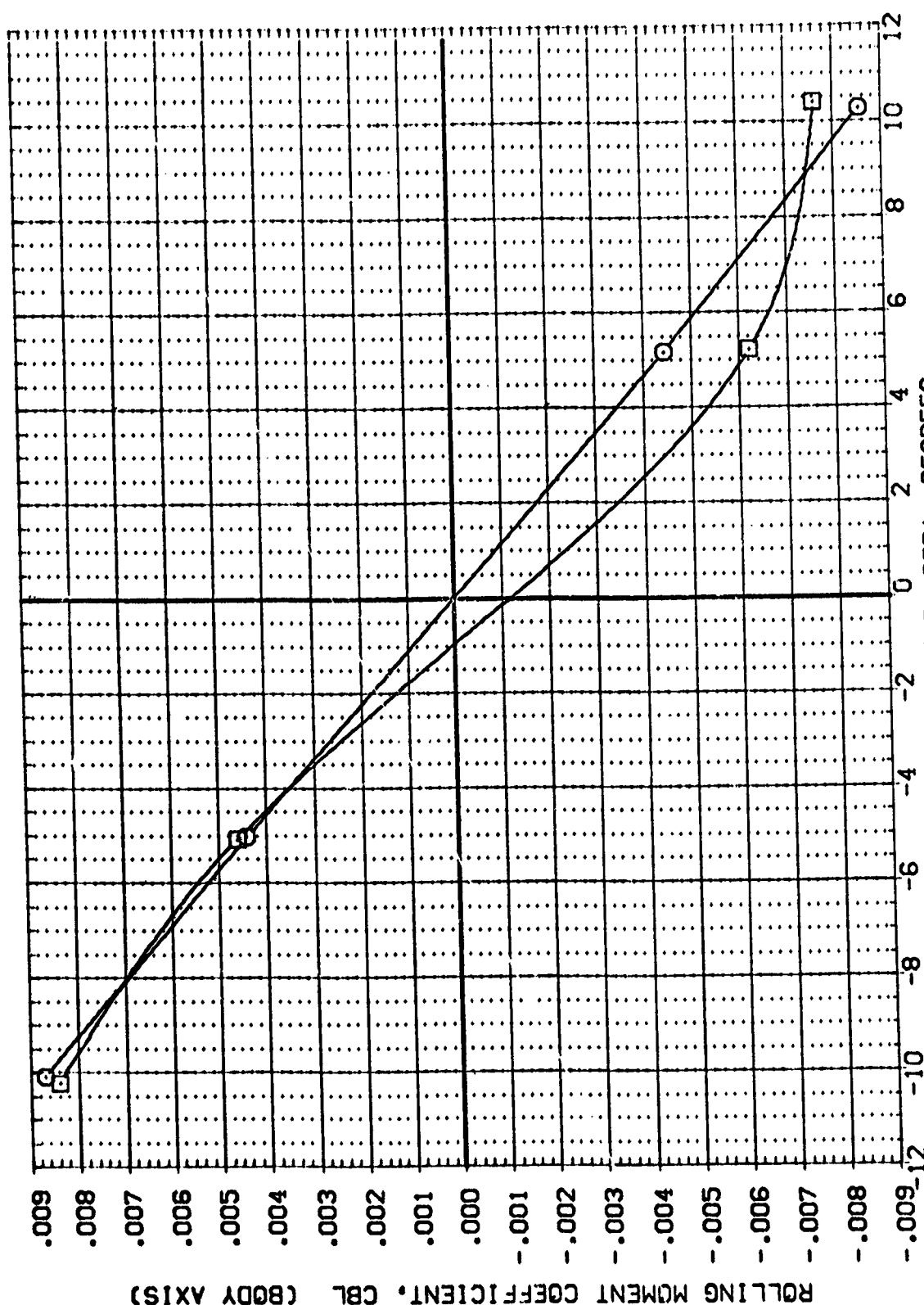


FIG. 7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597, 0.902

AMES 11-707 GA12 02A

REF	DATE	TIME	LOCATION	REFERENCE
SREF	2.4210			2.4210
LREF	38.8450			38.8450
BREF	38.8450			38.8450
XREF	32.3			32.3
YREF				
ZREF				
SCALE				

88

PARAMETRIC VALUES	
10.000	ELEVON
.000	RUCOFLR

ALPHA
BETA

65.50

SY-801

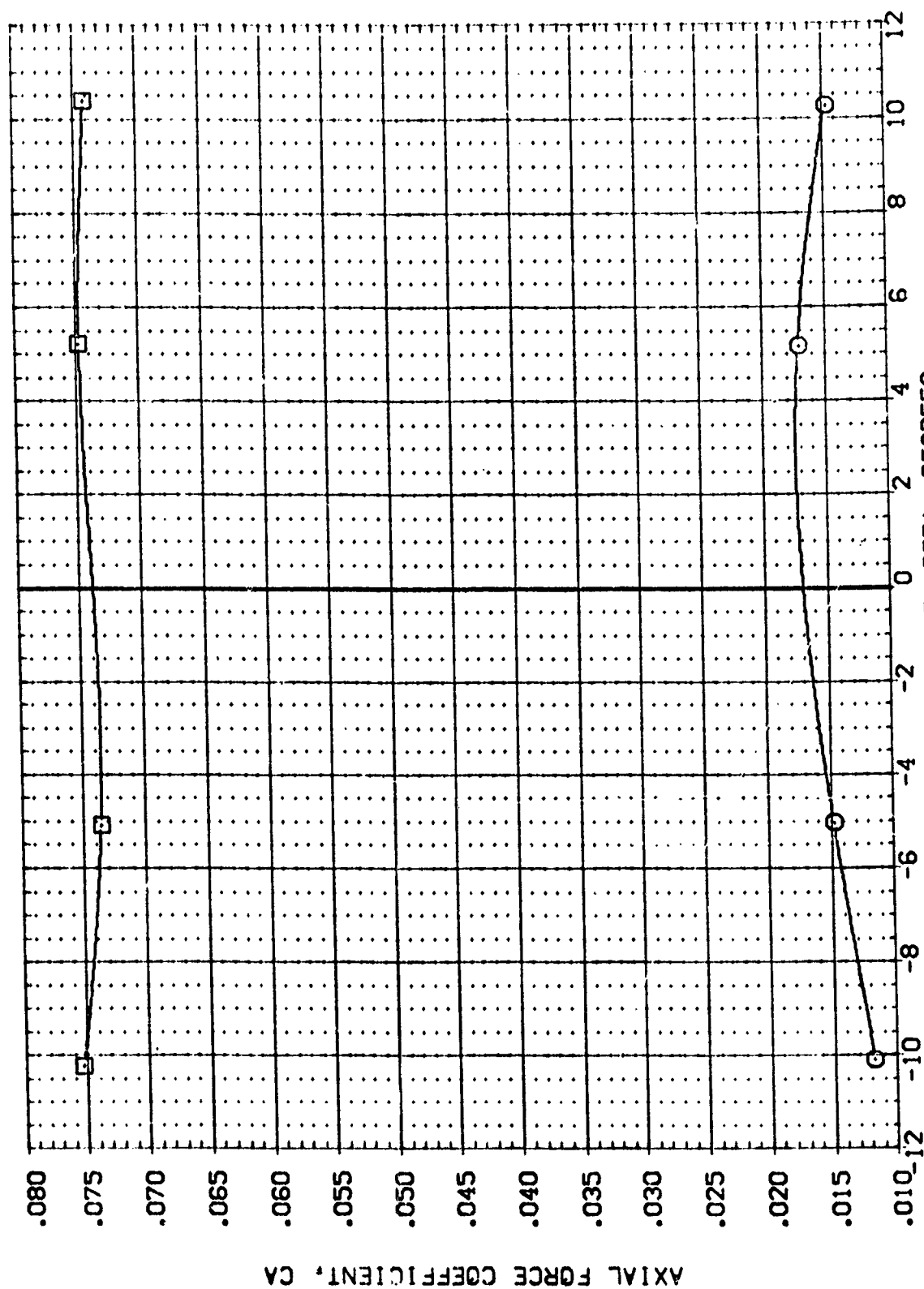


FIG. 7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597, 0.902

(RBP0004)

AVES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDLR .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
X-GRP 32.3000 IN.
Y-GRP 0.0000 IN.
Z-GRP 0.0000 IN.
SCALE 0.0000

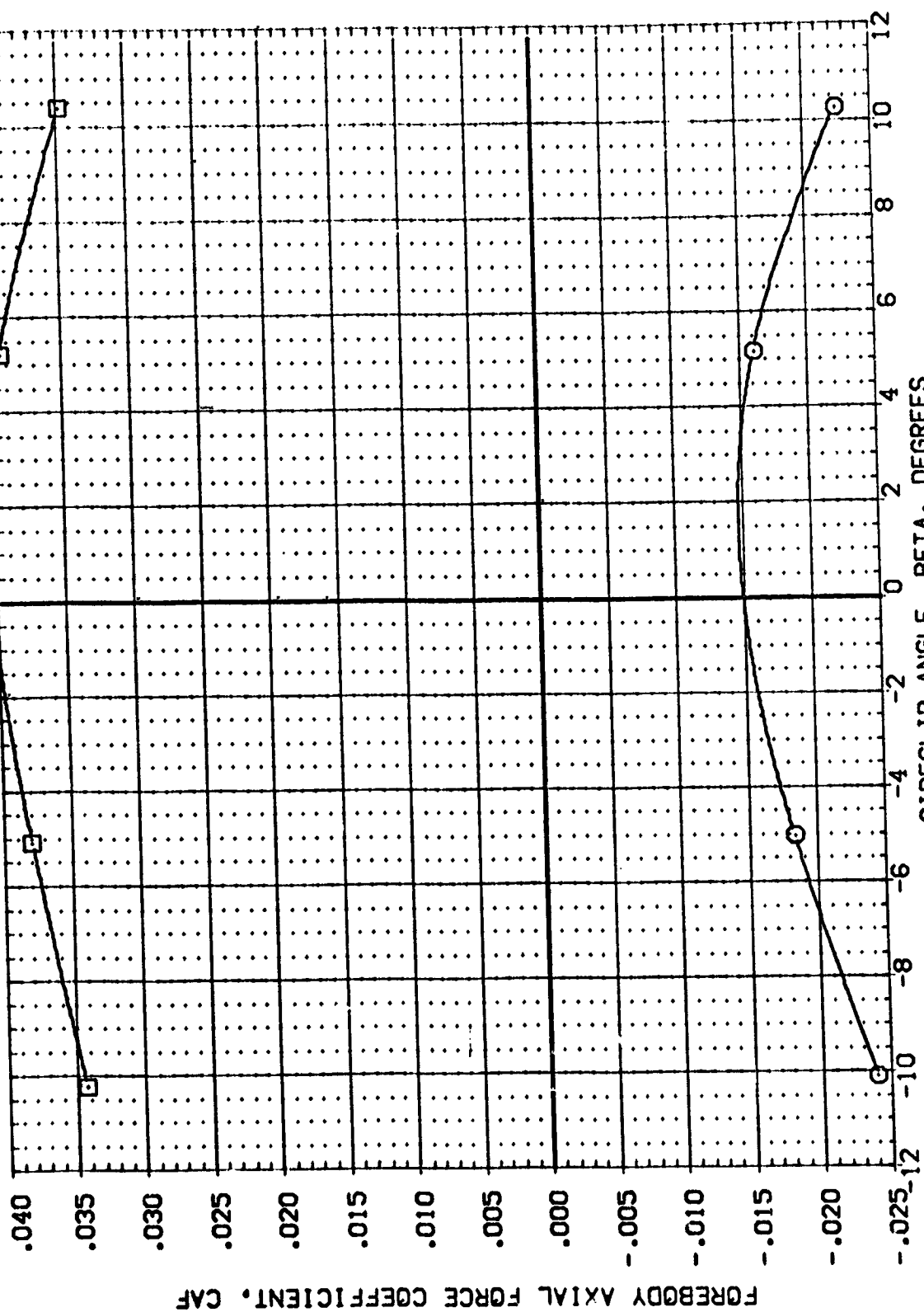


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597,0.902

(RBPC004)

AMES 11-707 0A12 02A

SYMBOL
□

MACH
.597
.902

ALPHA
RUDDER

PARAMETRIC VALUES
10.000
.000
ELEVON
RUOFLR

.000
.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.8450 IN.
BREF 38.8450 IN.
XMRD 32.3000 IN.
YMRD .0000 IN.
ZMRD .0000 IN.
SCALE .0300

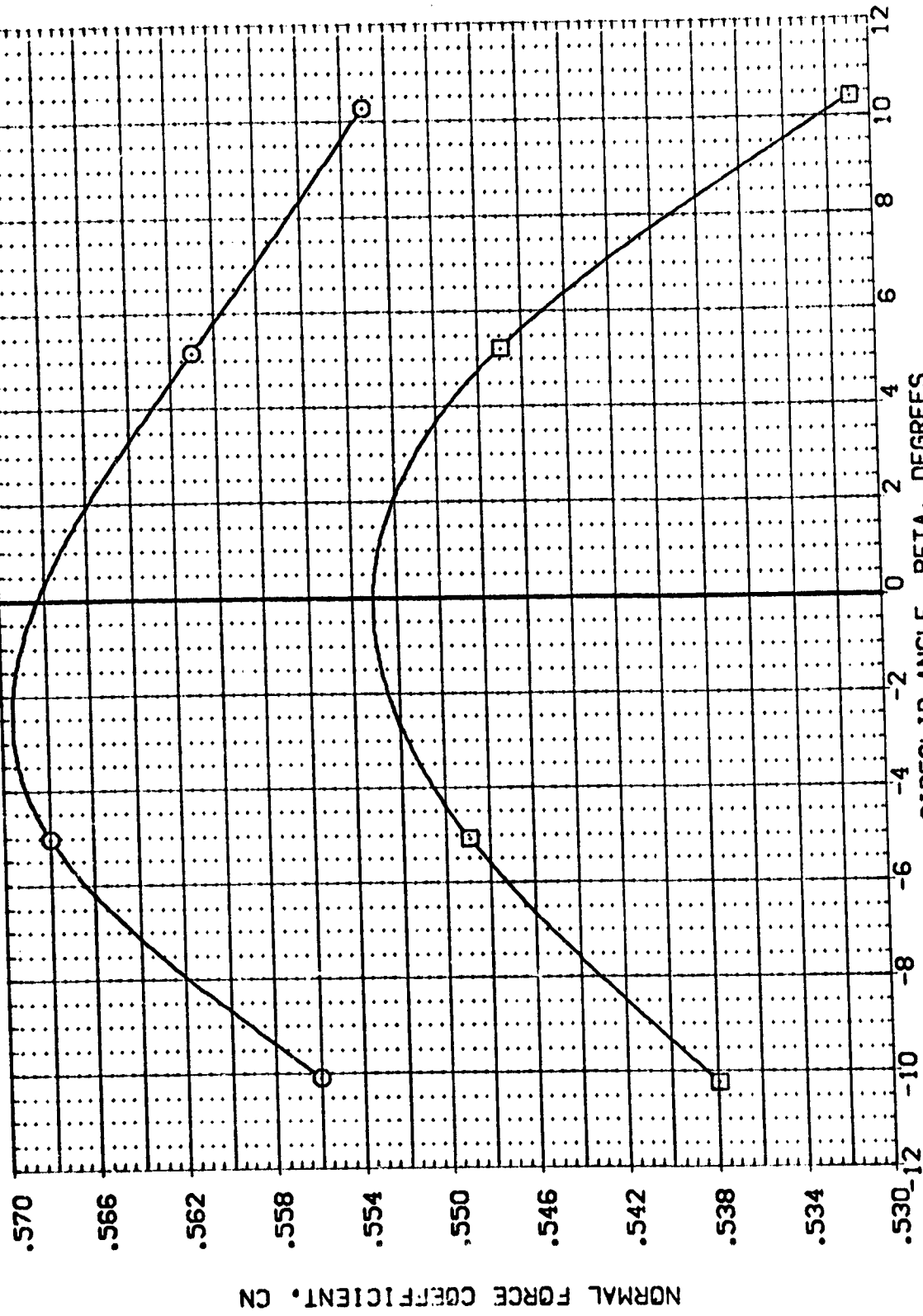


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597,0.902

(RBP004)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

PARAMETRIC VALUES
MACH .597 ALPHA 10.000 ELEVON .000
SYMBOL ☐ RUDDER .000 RUDFLR .000

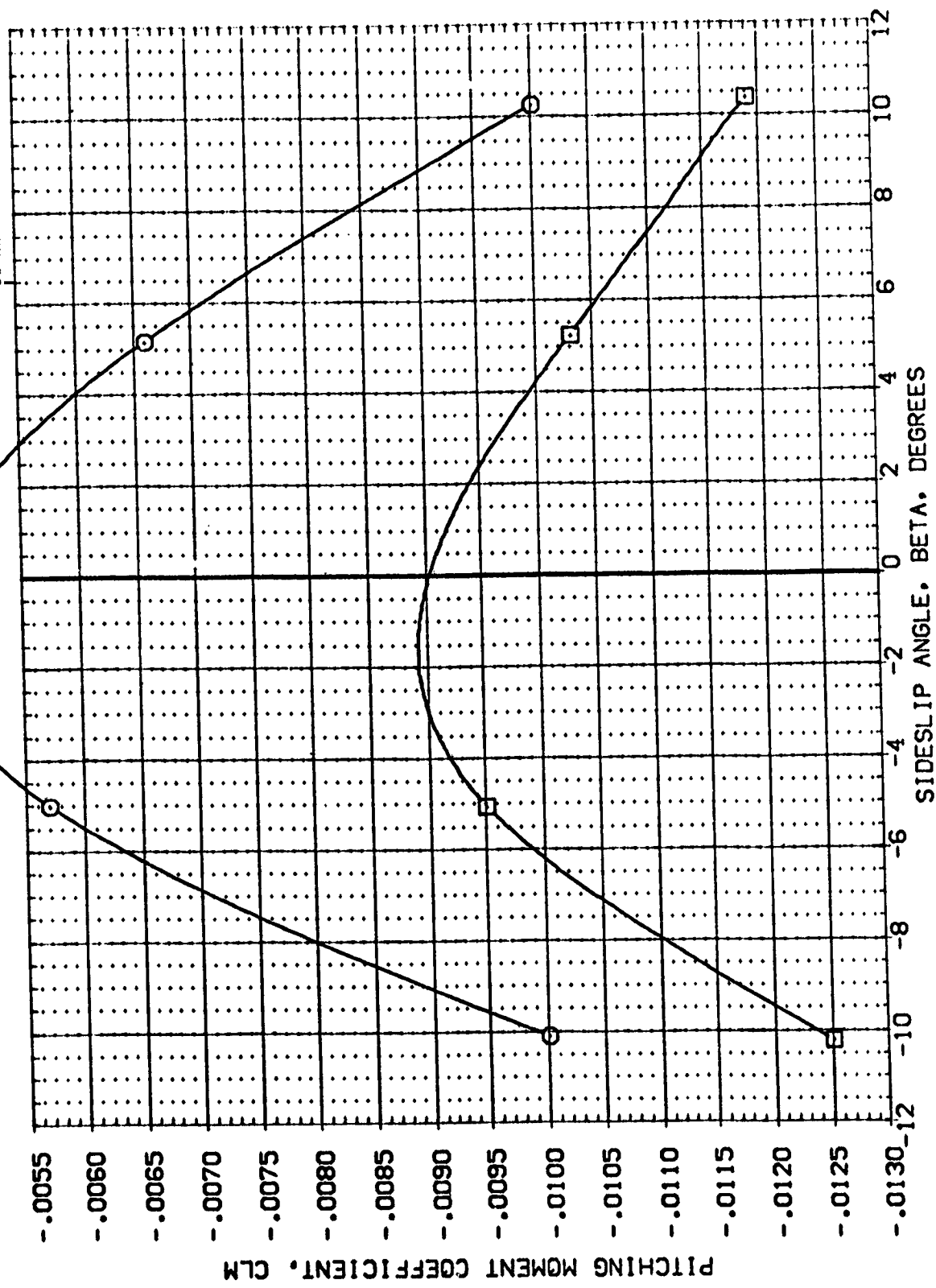


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597,0.902

AMES 11-707 0A12 02A

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
REF	39.8490
XXP	32.3000
WXP	.0000
ZXP	.0000
SCALE	.0300

SYMBOL	MACH	ALPHA	10,000	ELEVON	PARAMETRIC VALUES
0	.597				.000
1	.972	RUDDER	.000	RJDFLR	.000

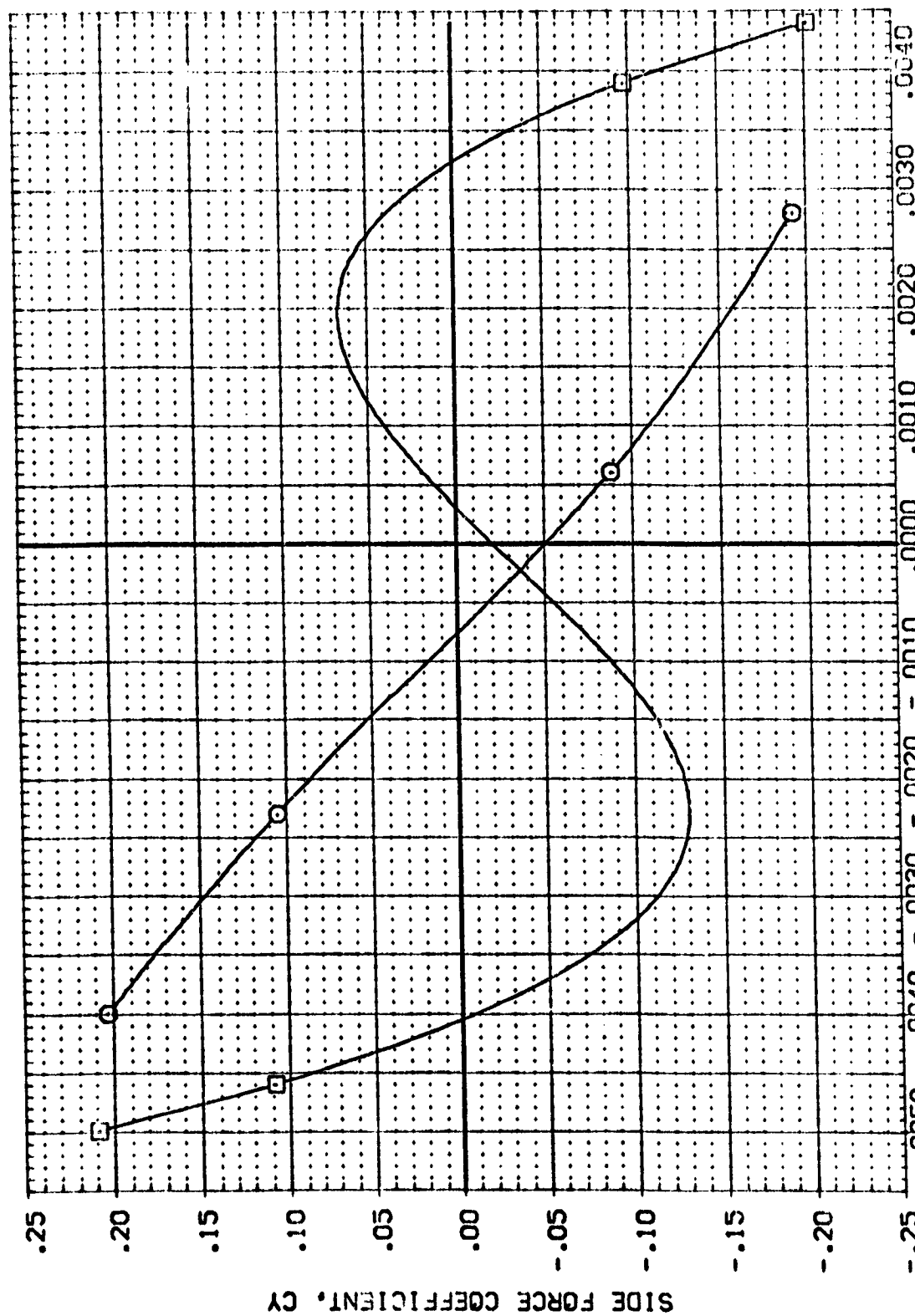


FIG. 7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597, 0.902

AMES 11-707 0A12 02A

(ABP0004)

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
		ALPHA	ELEVON	RUOFLR	SREF	2.4210	SQ.FT.
○	.597	10.000	.000	.000	LREF	39.8450	IN.
□	.902	.000	.000	.000	BREF	39.8450	IN.
					XREF	32.3000	IN.
					YREF	.0000	IN.
					ZREF	.0000	IN.
					SCALE	.0300	SCALE

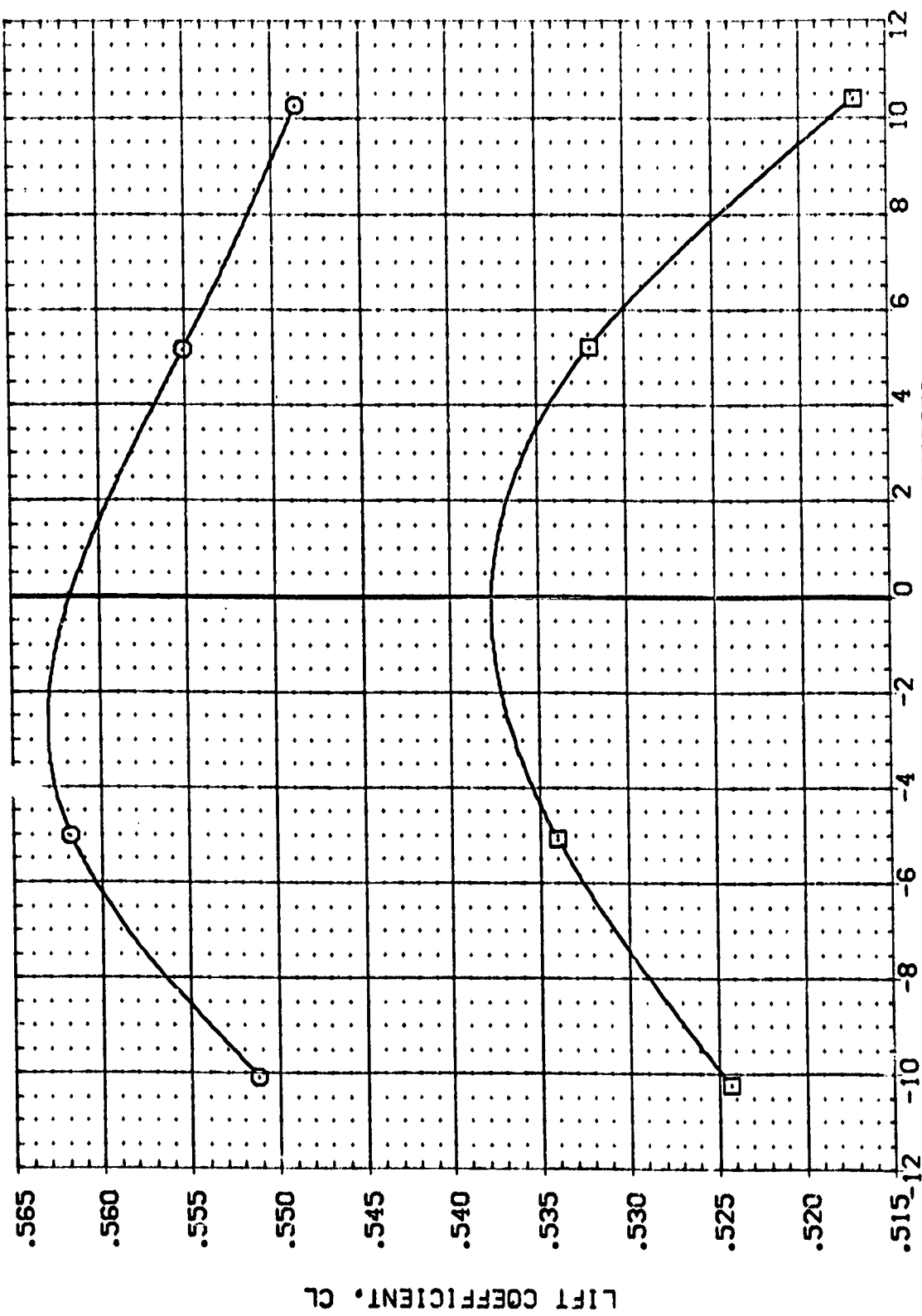


FIG.7 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=10 DEGS., MN=0.597,0.902

(RBP005)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUFLR
O .599 .904 .000 .000
□ 15.000 .000 .000

REFERENCE INFORMATION
SREF 2.4210
REF 30.8480
REF 30.6480
REF 32.0000
XREF 32.0000
YREF 32.0000
ZREF 32.0000
SCALE .0300

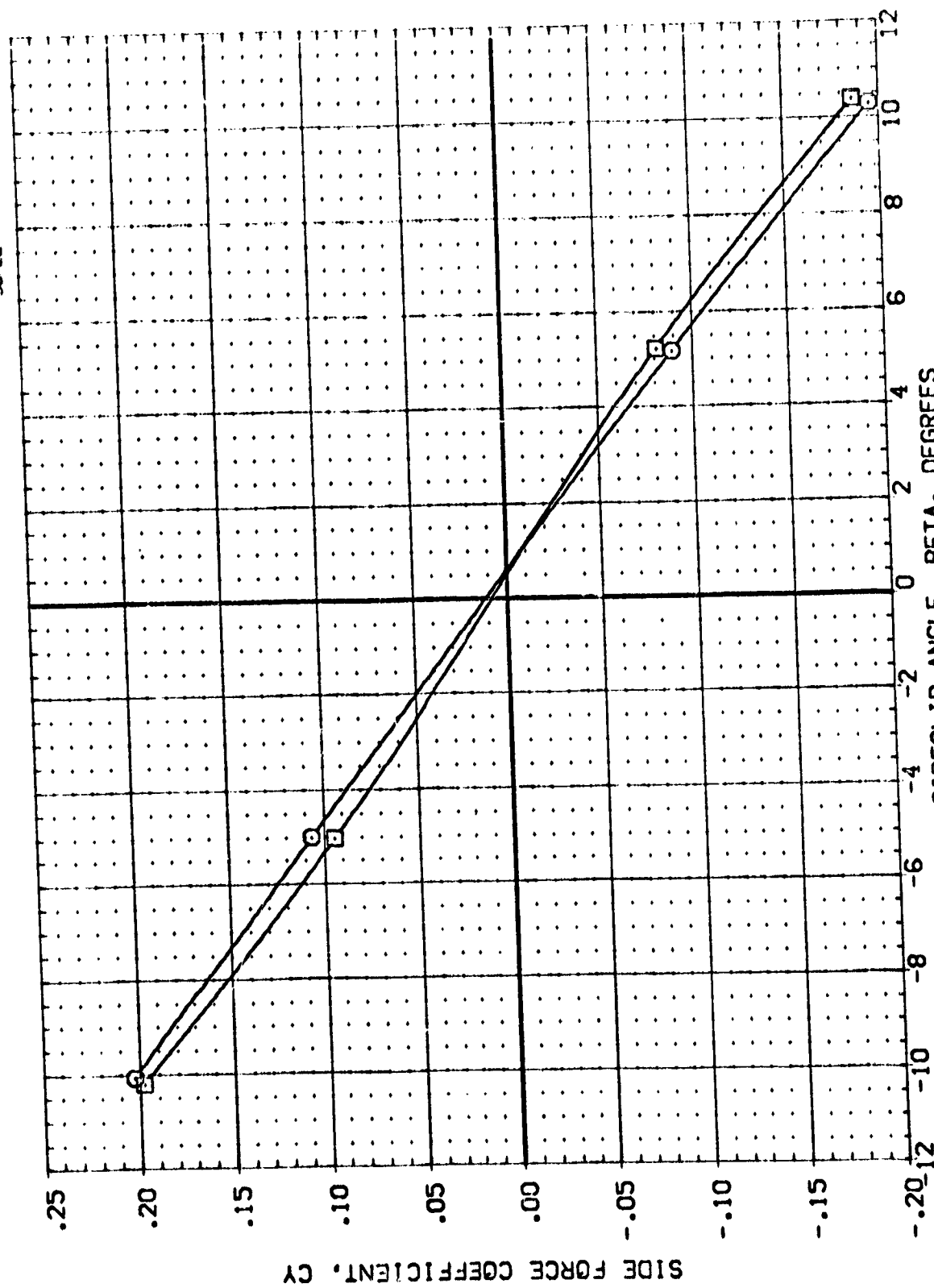


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

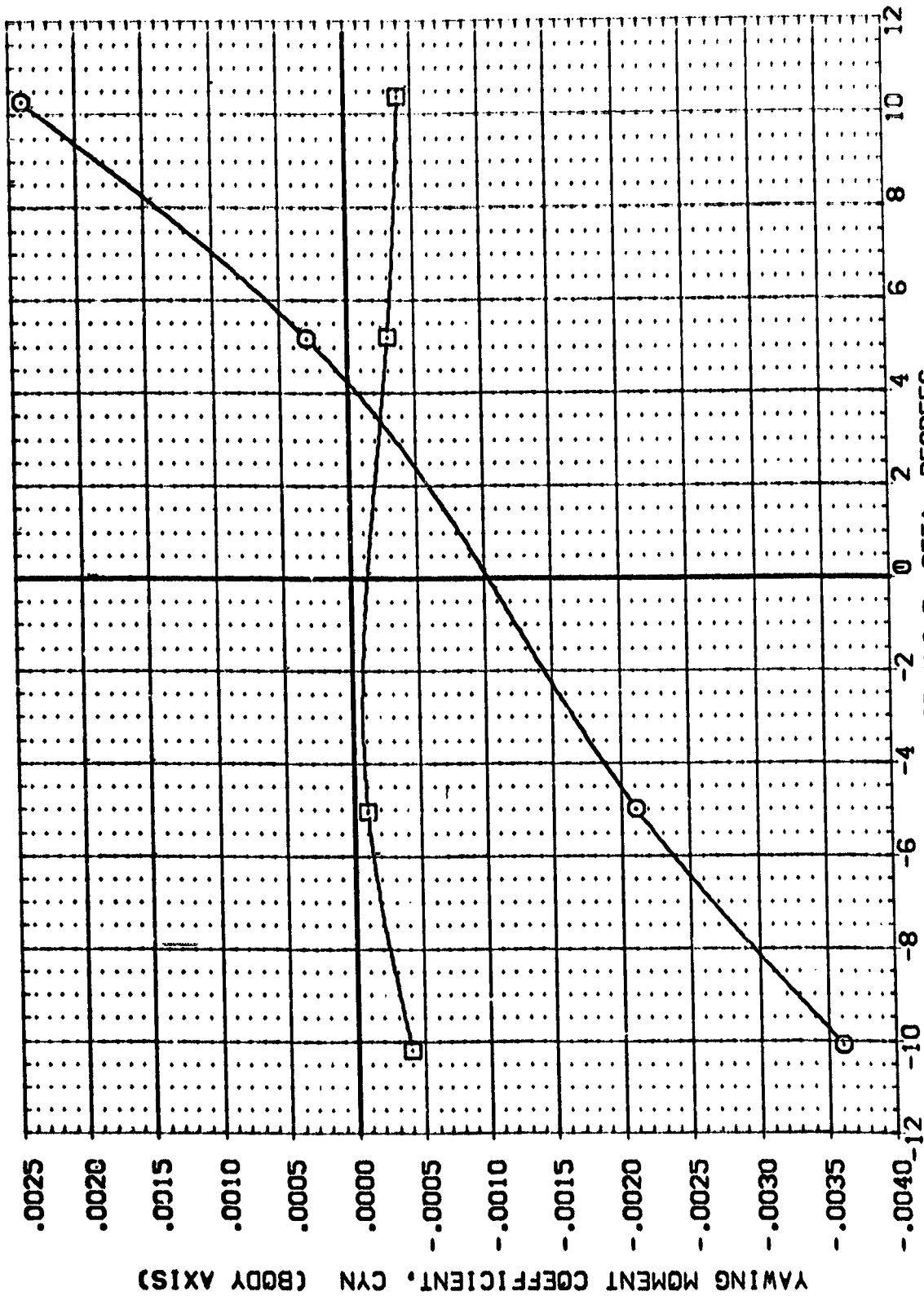


AMES 11-707 0A12 02A

(RBP005)

SYMBOL MACH ALPHA RUDDER
 O .599 .904
 □ 15.000 .000
 ELEVON RUDDER
 .000 .000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 38.849C
 BREF 38.845C
 XGRP 32.300C
 YGRP 1.000C
 ZGRP 1.000C
 SCALE



SIDESLIP ANGLE, BETA, DEGREES

FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

CR3P005

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	.000
□	.599	RUDDER	15.000	RUDFLR	.000

REFERENCE INFORMATION	
SPEC	2.4210
REF	39.845C
REF	39.845C
XREF	30.3000
YREF	0.0000
SCALE	0.0001

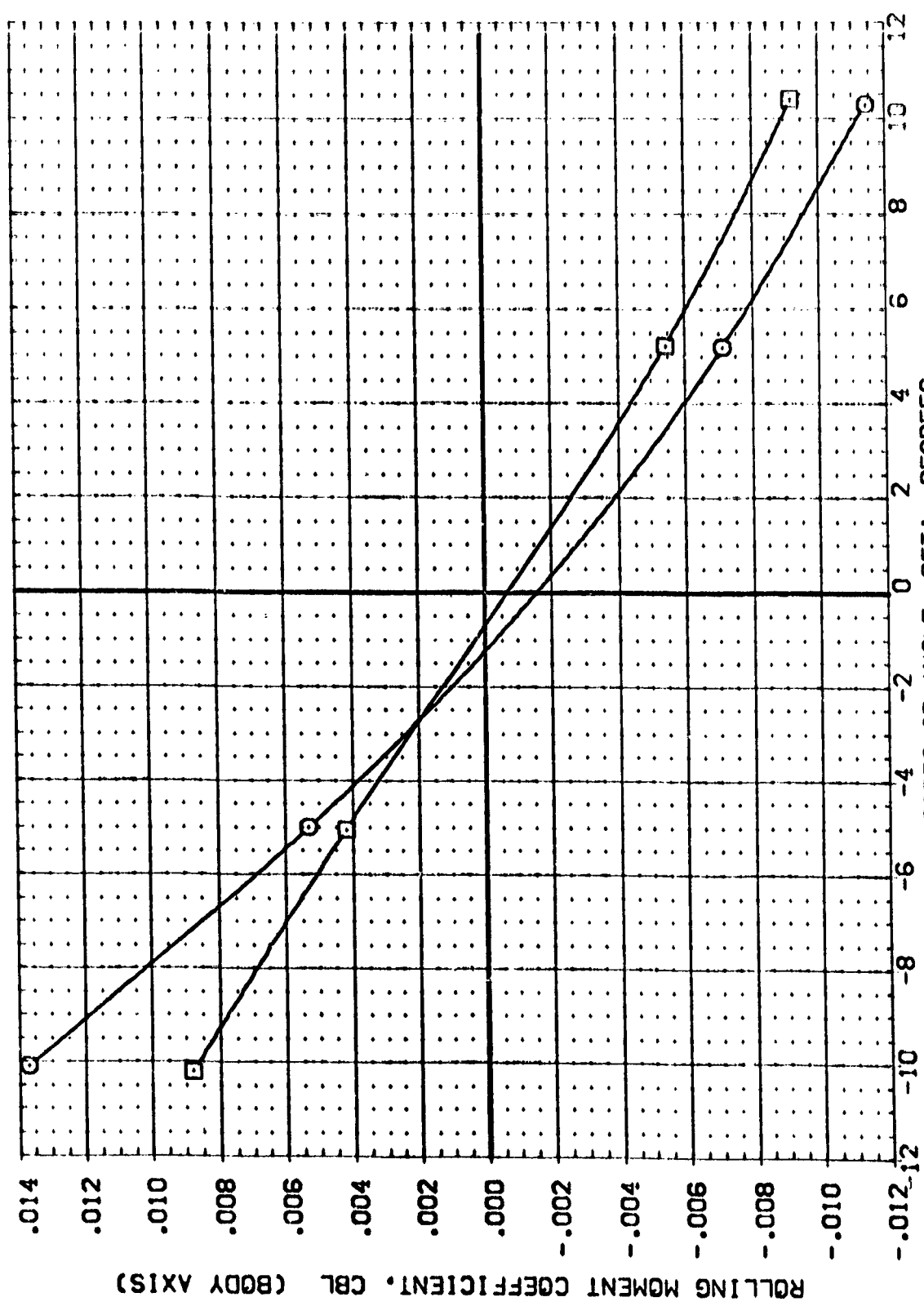


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MW=0.599,0.904



(R8P005)

AMES 11-707 CA12 C2A

SYMBOL MACH ALPHA RUDER ELEVON RUDFLR .000 .000 .000

REFERENCE INFORMATION
SPEED 2.4210
ALT 26.6180
SFC 22.5180
WIND 22.3000
SCALE

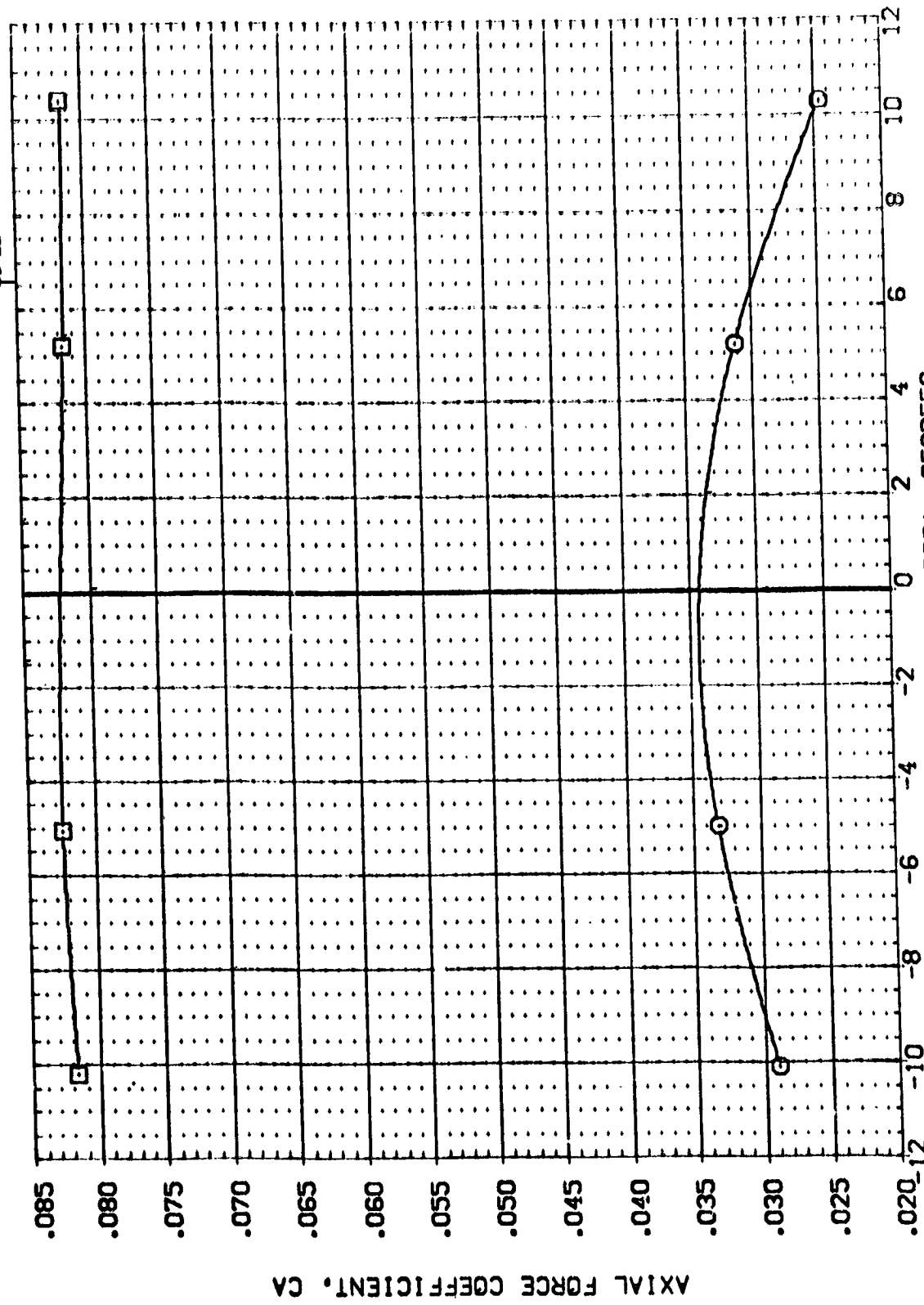


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

0250055

AMES 11-707 GA12 G2A

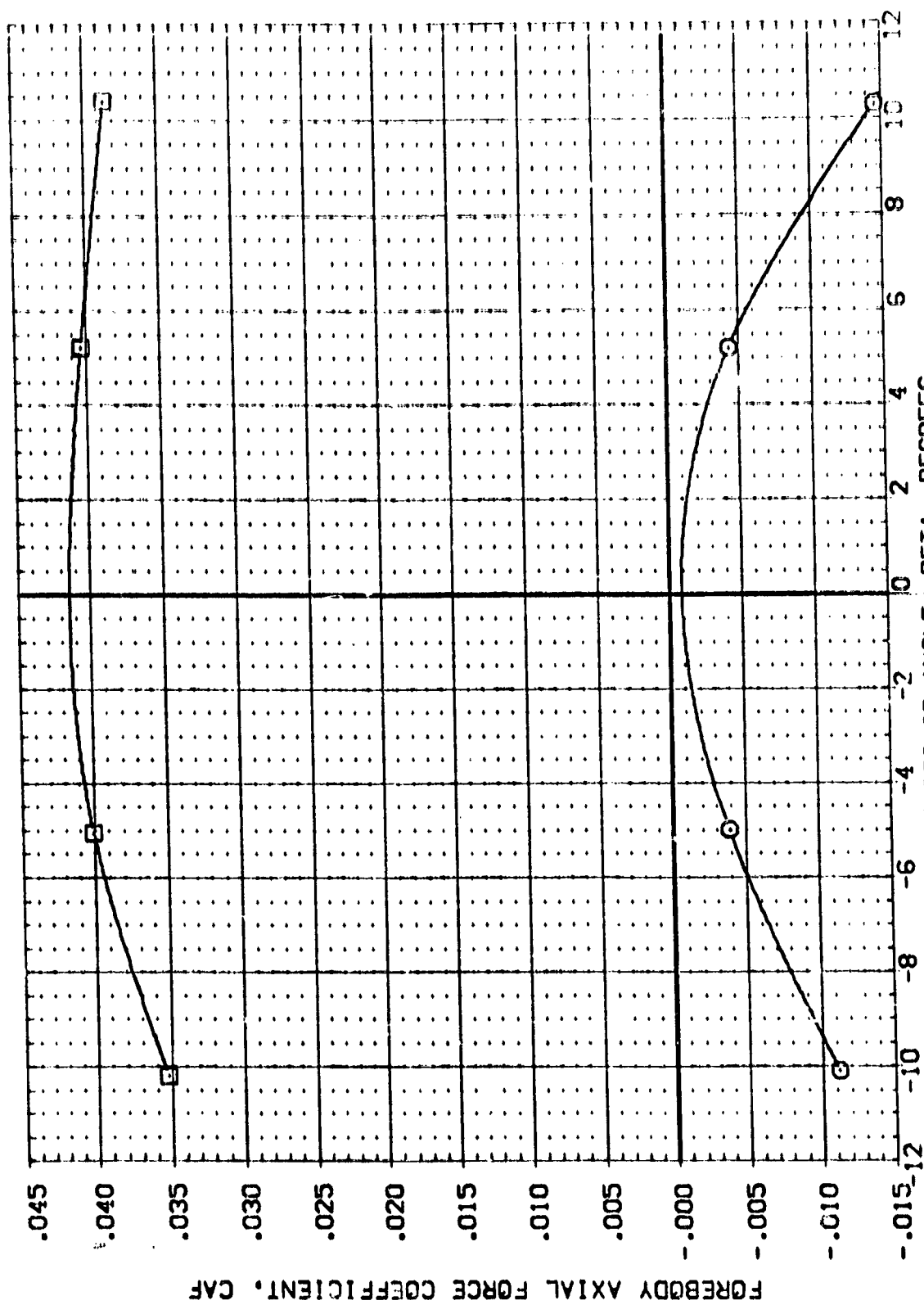
[illegible]

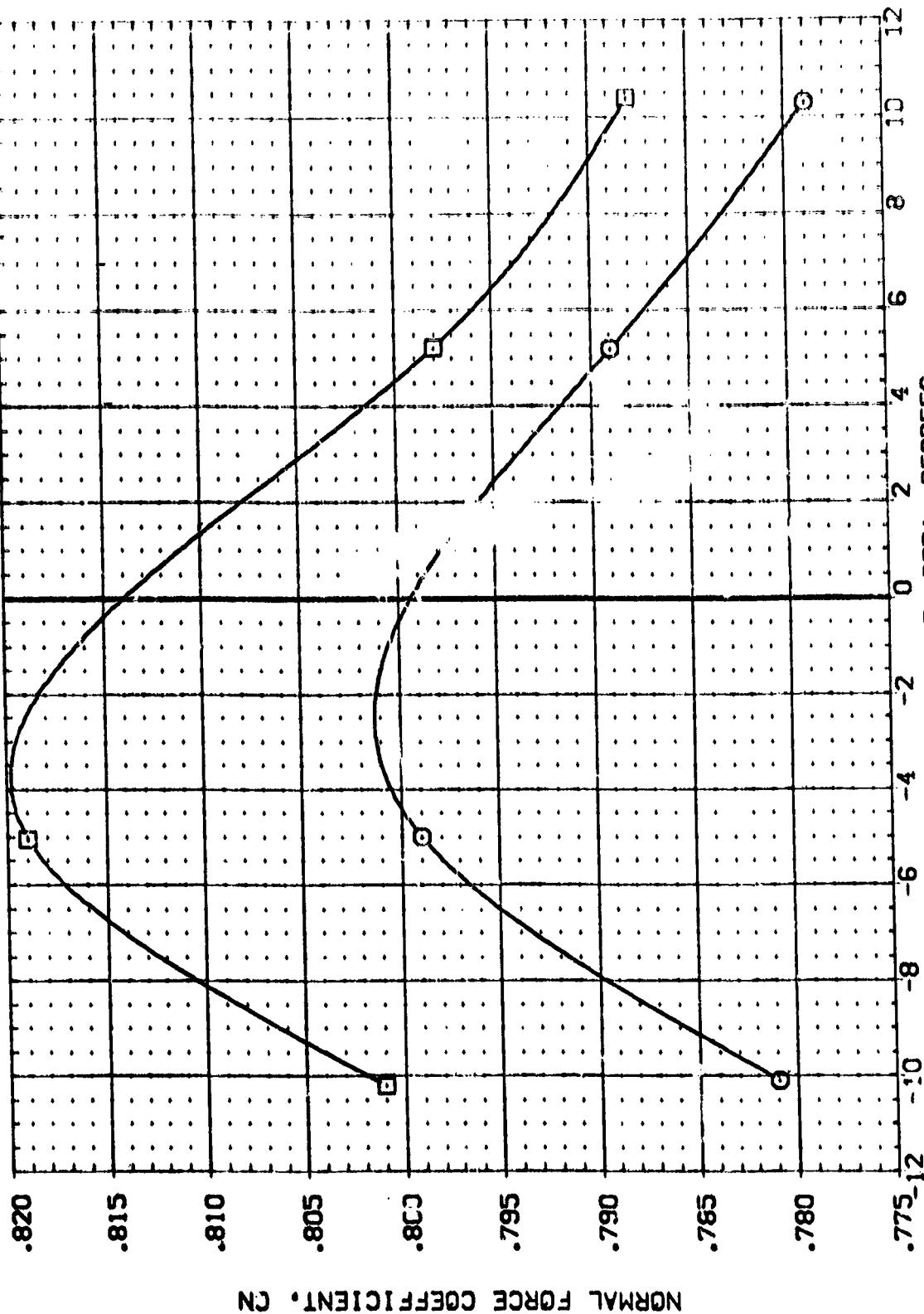
FIG. 8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., $MN=0.599$, 0.604
SIDESLIP ANGLE, BETA, DEGREES
 0.599
 0.604

(CRBP005)

AMES 11-707 OA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER .000 .000

REFERENCE INFORMATION
SREF 2.4212
REF 20.895
SREF 20.895
REF 20.895
YREF 20.895
ZREF 20.895
SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

(RBP005)

AMES 11-707 0A12 02A

SYMB. MACH ALPHA RUDDER
□ .599 .904
□ .000 .000

PARAMETRIC VALUES
15.000 ELEVON
.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8493 IN.
BREF 39.8493 IN.
XGRP 32.3000 IN.
YGRP .0000 IN.
ZGRP .0000 IN.
SCALE .0300

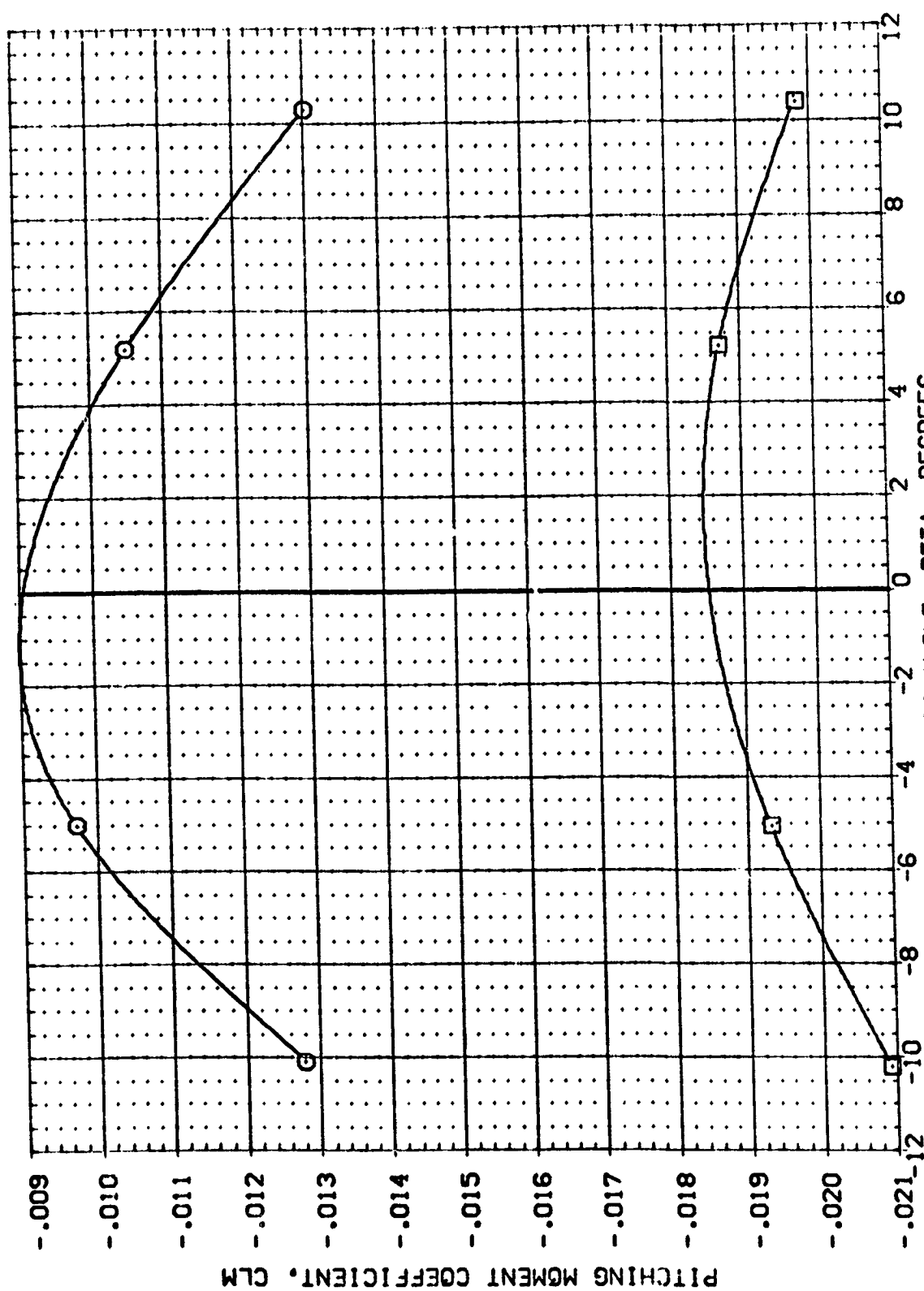


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

(RBP005)

AMES : 1-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .599 .904 15.000 .000 ELEVEN .000
□ .000 .000 .000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

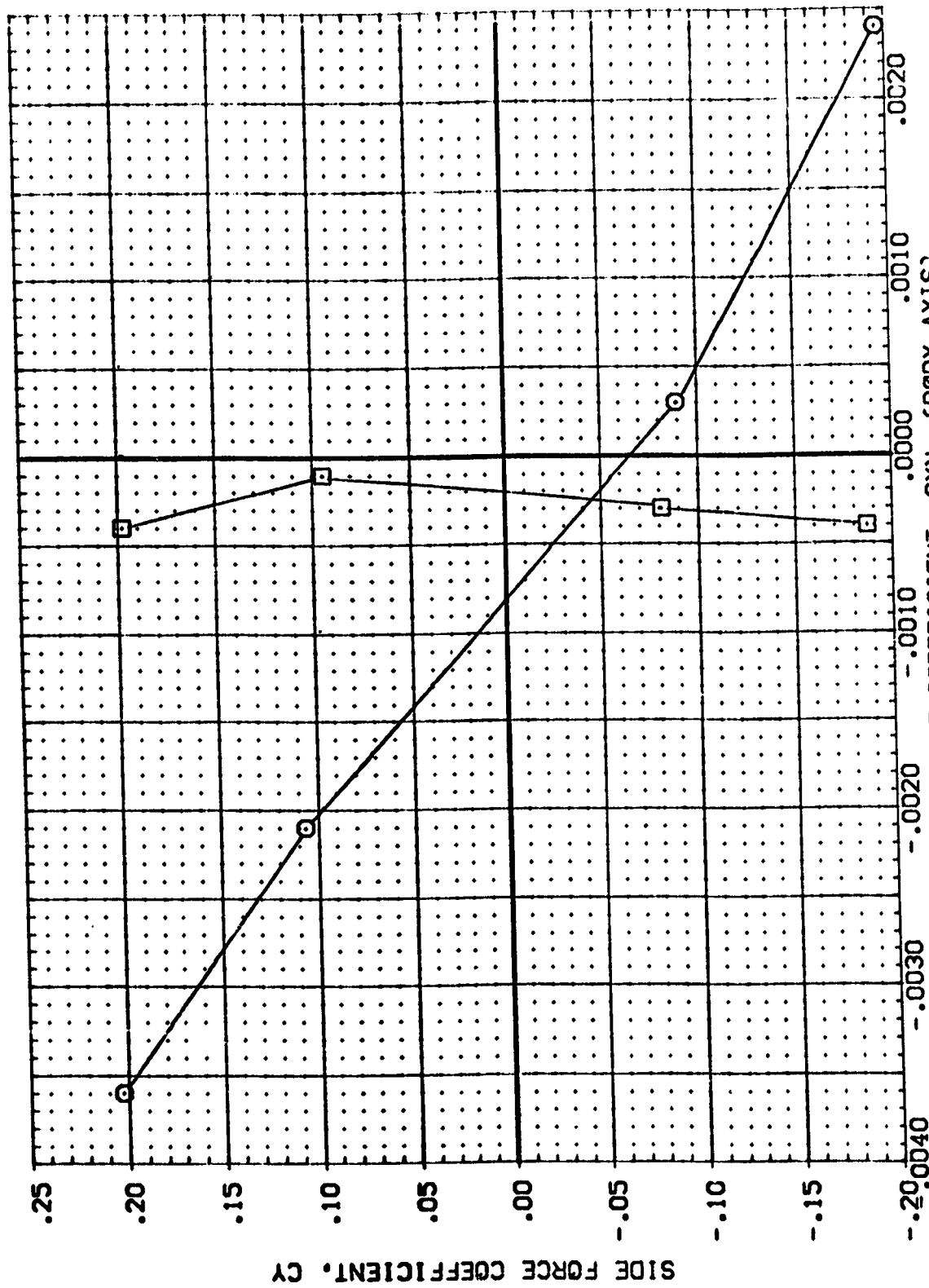


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599, 0.904

(ABP005)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDFLR
○	.589		15.000	.000	
□	.904		.000		.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

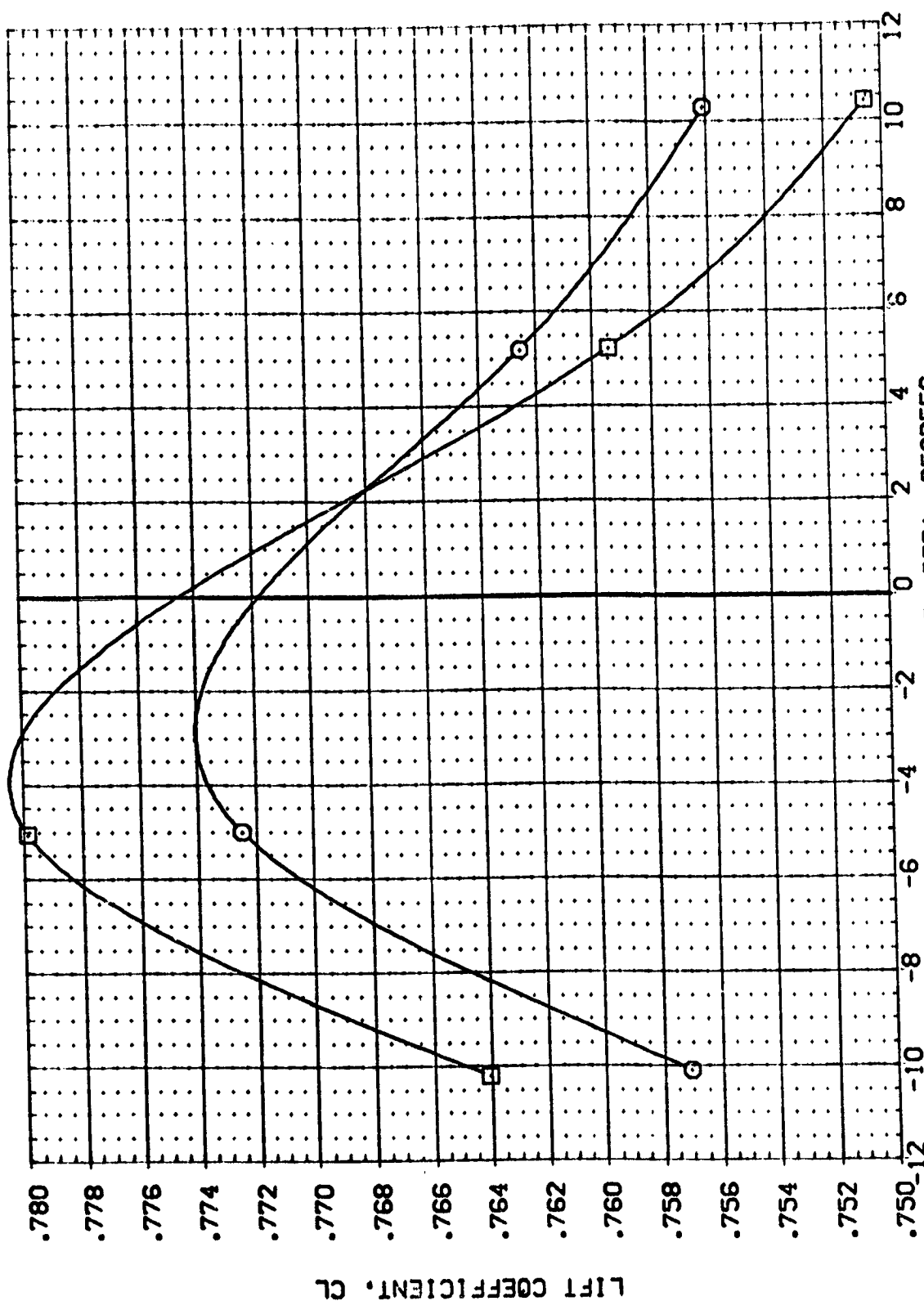


FIG.8 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=15 DEGS., MN=0.599,0.904

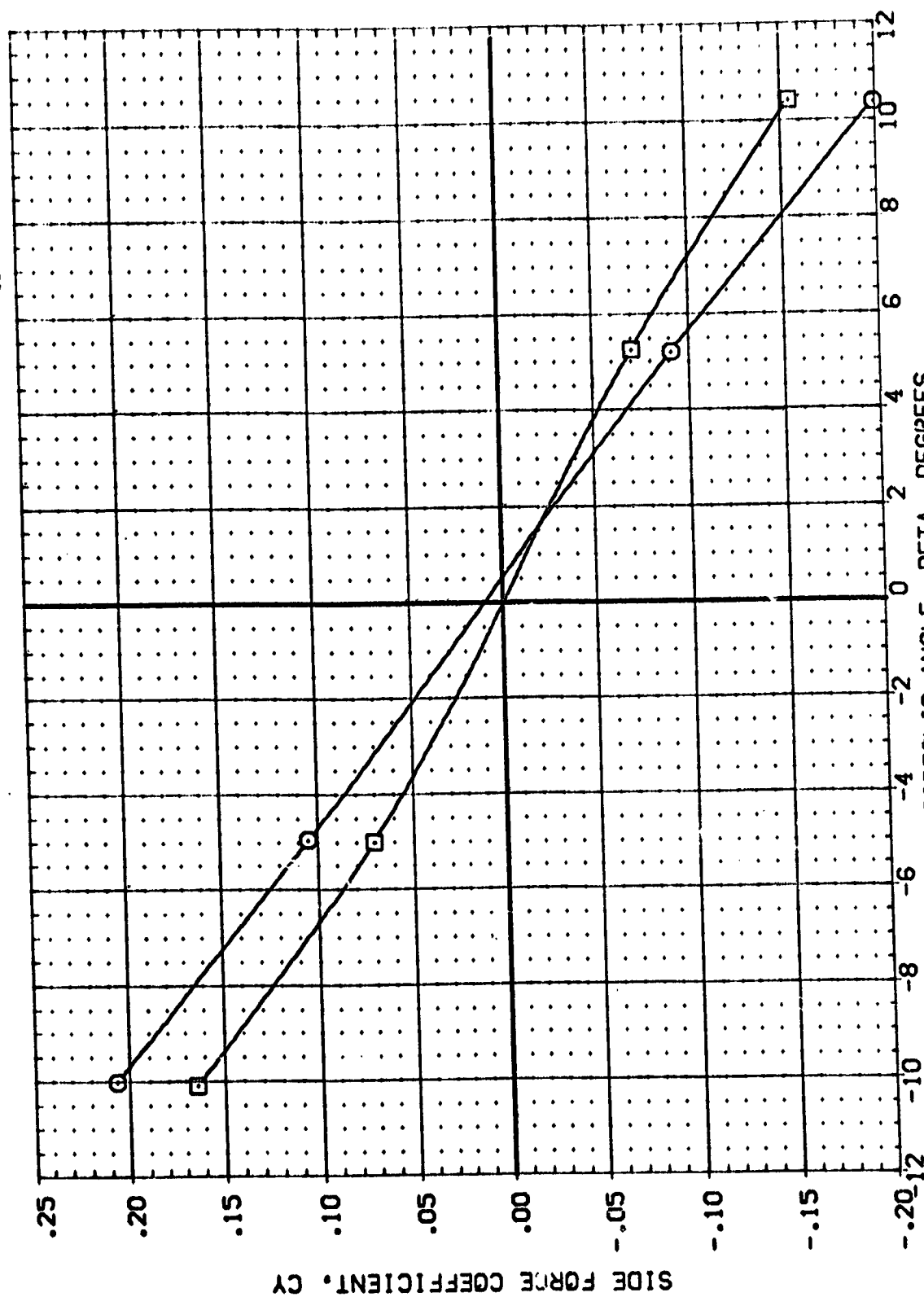


(RBP0006)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 O .599 .902 20.000 .000 ELEVON .000
 □ .902 .000 .000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 XREF 32.3000 IN.
 YREF .0000 IN.
 ZREF .0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902

(RBP006)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 □ .599 .902 .000 .000 ELEVON RUOFLR .000

REFERENCE INFORMATION
 SREF 2.421C SQ.FT.
 LREF 39.8490 N.
 BREF 39.8490 N.
 XGRP 32.3000
 YGRP .0000
 ZGRP .0000
 SCALE .0000

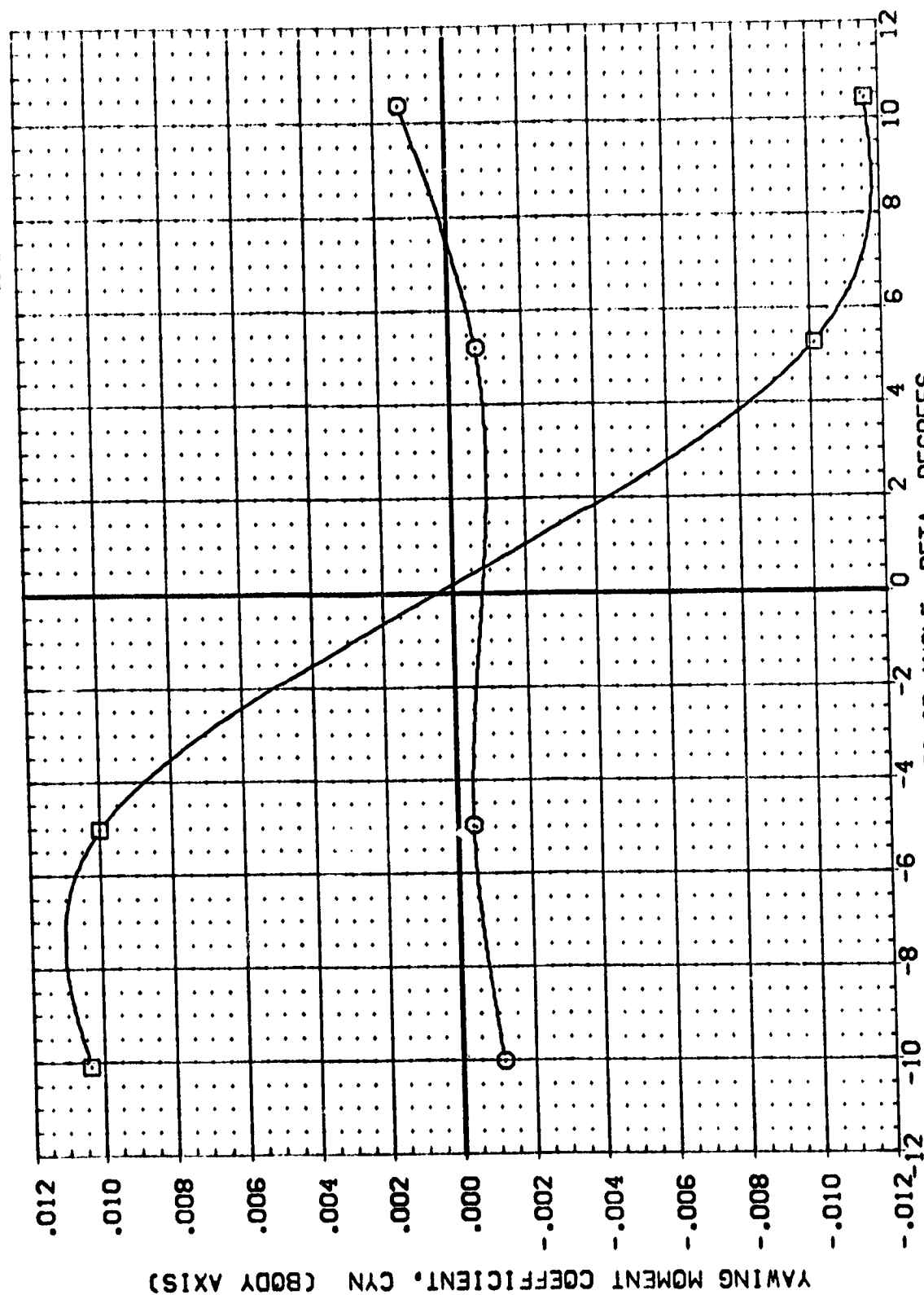


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902

(RBP006)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER
 O .599 .000
 □ .902 .000

PARAMETRIC VALUES
 20.000 ELEVON
 .000 RUOFLR

REFERENCE INFORMATION
 SREF 2.4212
 LREF 38.8452
 BREF 38.8452
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE .0300

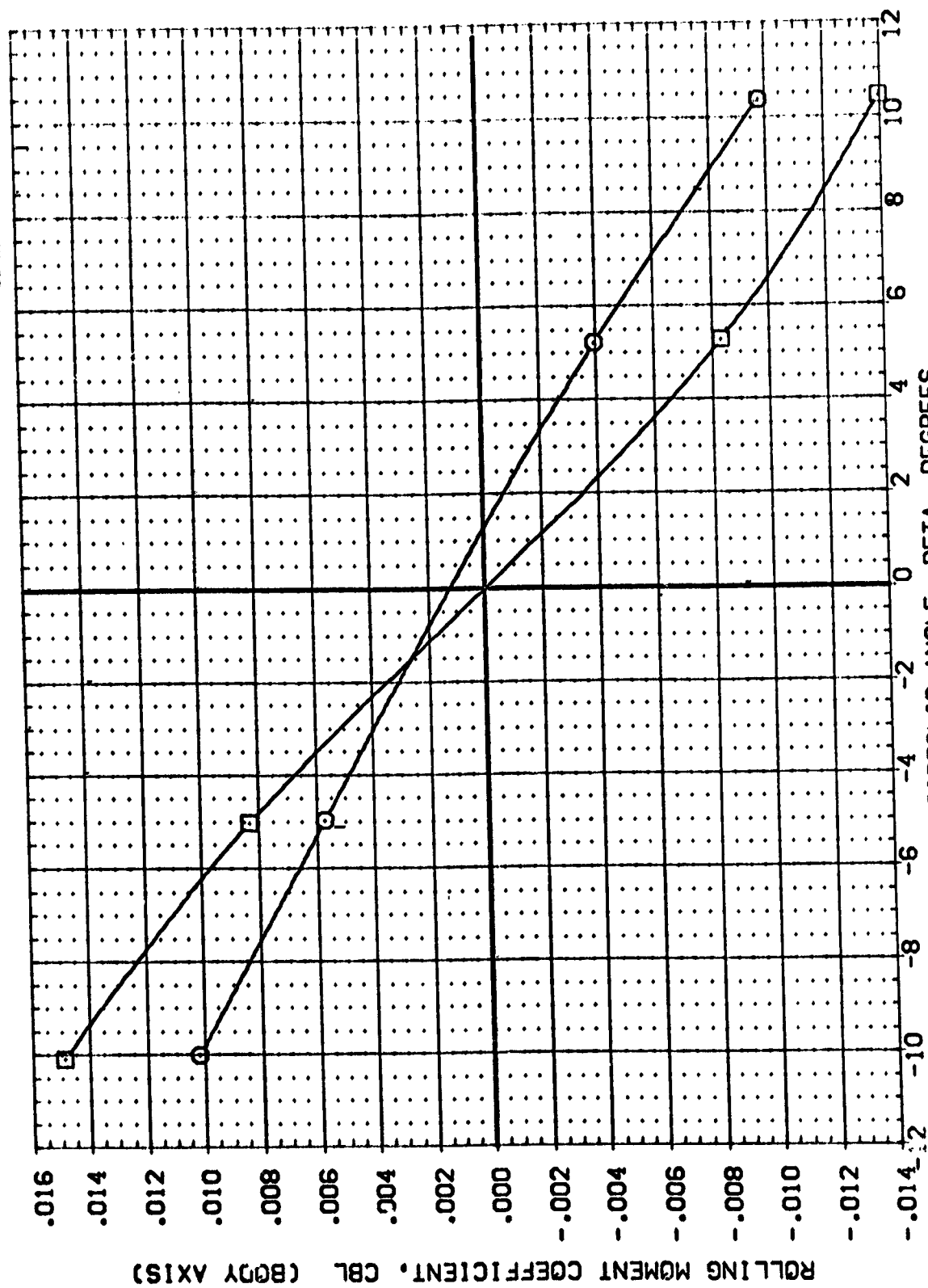


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902



AMES 11-707 0A12 02A

(RBP006)

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 35.8450
BREF 39.8450
XGRP 32.3000
YGRP 1.0000
ZGRP 1.0000
SCALE 1.0000

SYMBOL MACH ALPHA RUDDER
○ .599 .000
□ .902 .000

PARAMETRIC VALUES
20.000 ELEVON
.000 RUOFLR

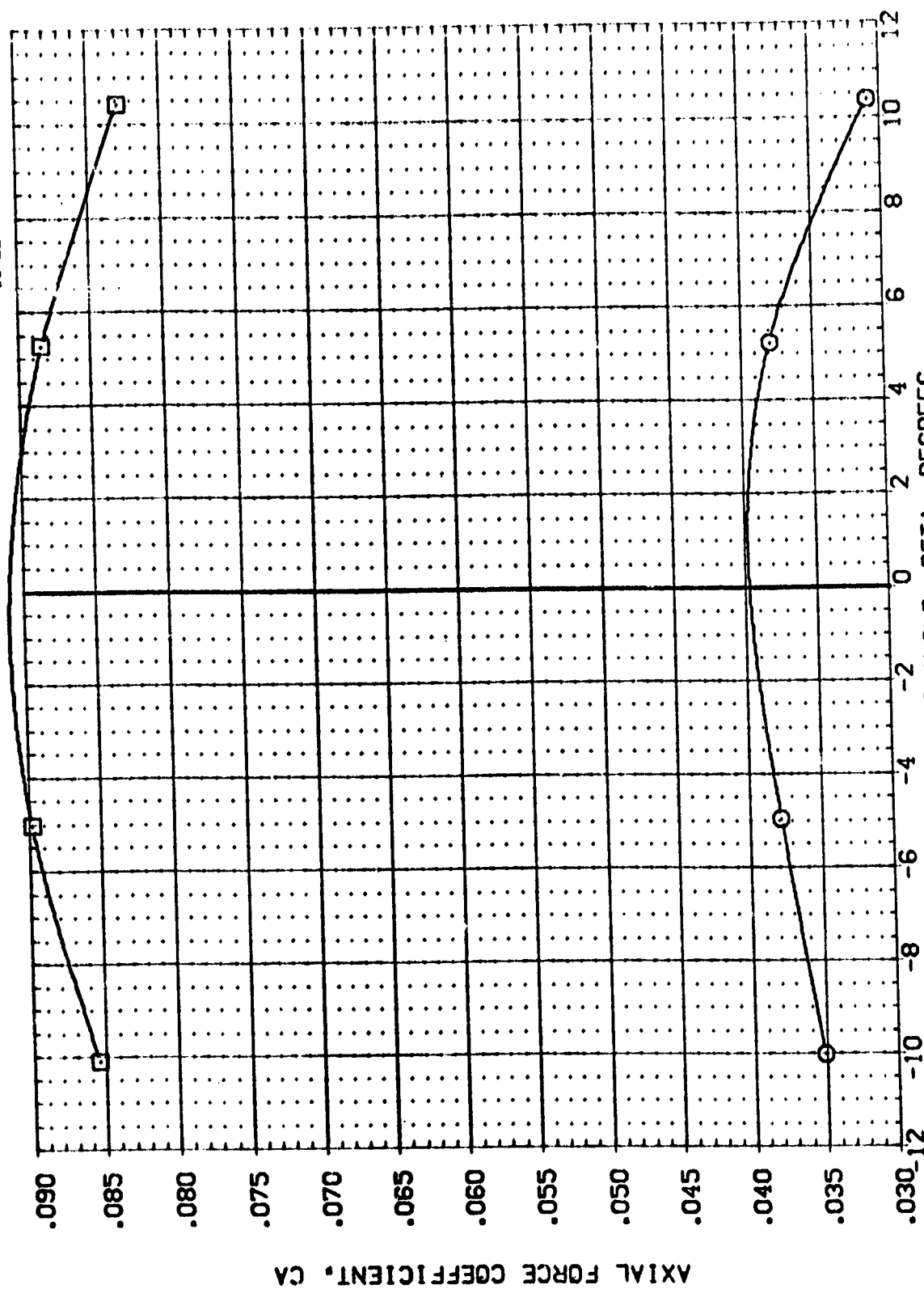


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902

AMES 11-707 0A12 02A

(RBP006)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 O .599 .902 20.000 .000 ELEVON .000
 □ .000 .000 RUDDER .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 38.8490
 BREF 32.8490
 CRP 32.3000
 PRP .0000
 SCALE .0000

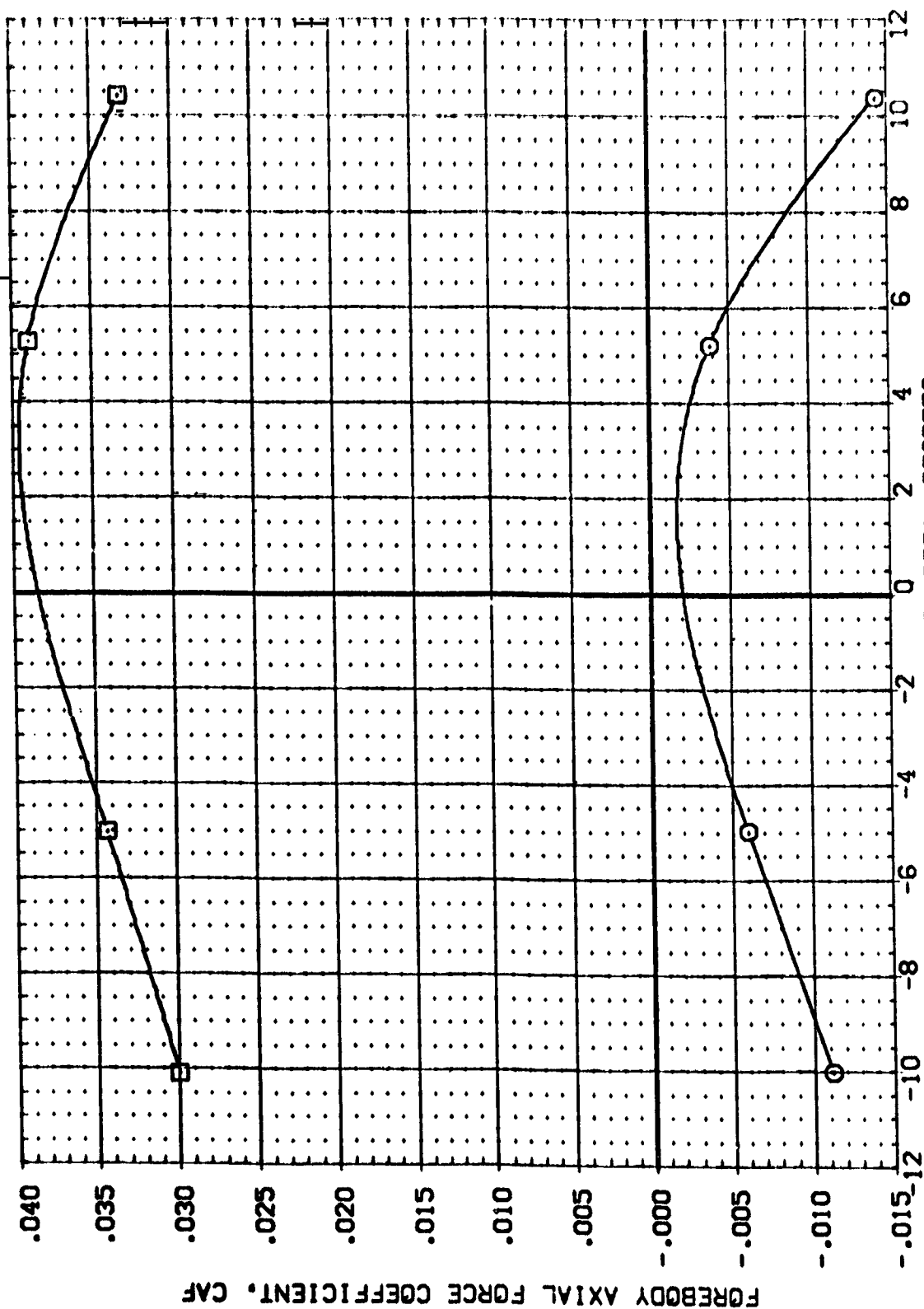


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599, 0.902

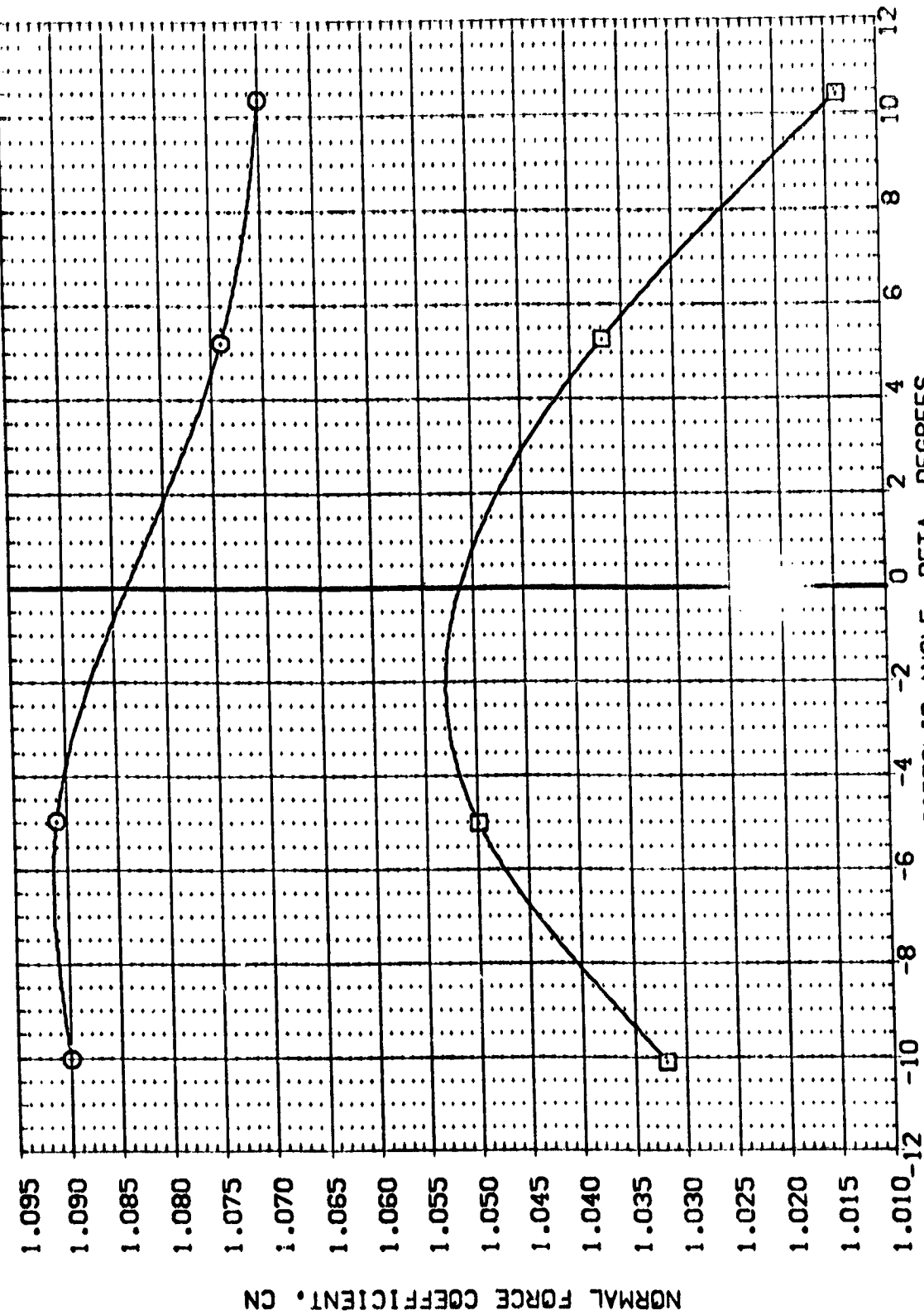


(RBPC06)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 ○ .599 .902
 □ 20.000 .000
 PARAMETRIC VALUES
 20.000 ELEVON .000
 .000 RUDDER .000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 39.845C
 BREF 39.845C
 YREF 32.300C
 ZREF .000C
 SCALE .000C
 50 FT.



SIDESLIP ANGLE, BETA, DEGREES

FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902



AMES 11-70' 0A12 02A

(R3P006)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDDER
○	.599	20.000	.000	.000	
□	.902	.000	.000	.000	

REFERENCE INFORMATION

SREF	2.4210	50. FT.
XREF	38.8490	IN.
YREF	38.8490	IN.
XPRP	32.3100	IN.
YPRP	32.3100	IN.
ZPRP	0.0000	IN.
SCALE	1.000	

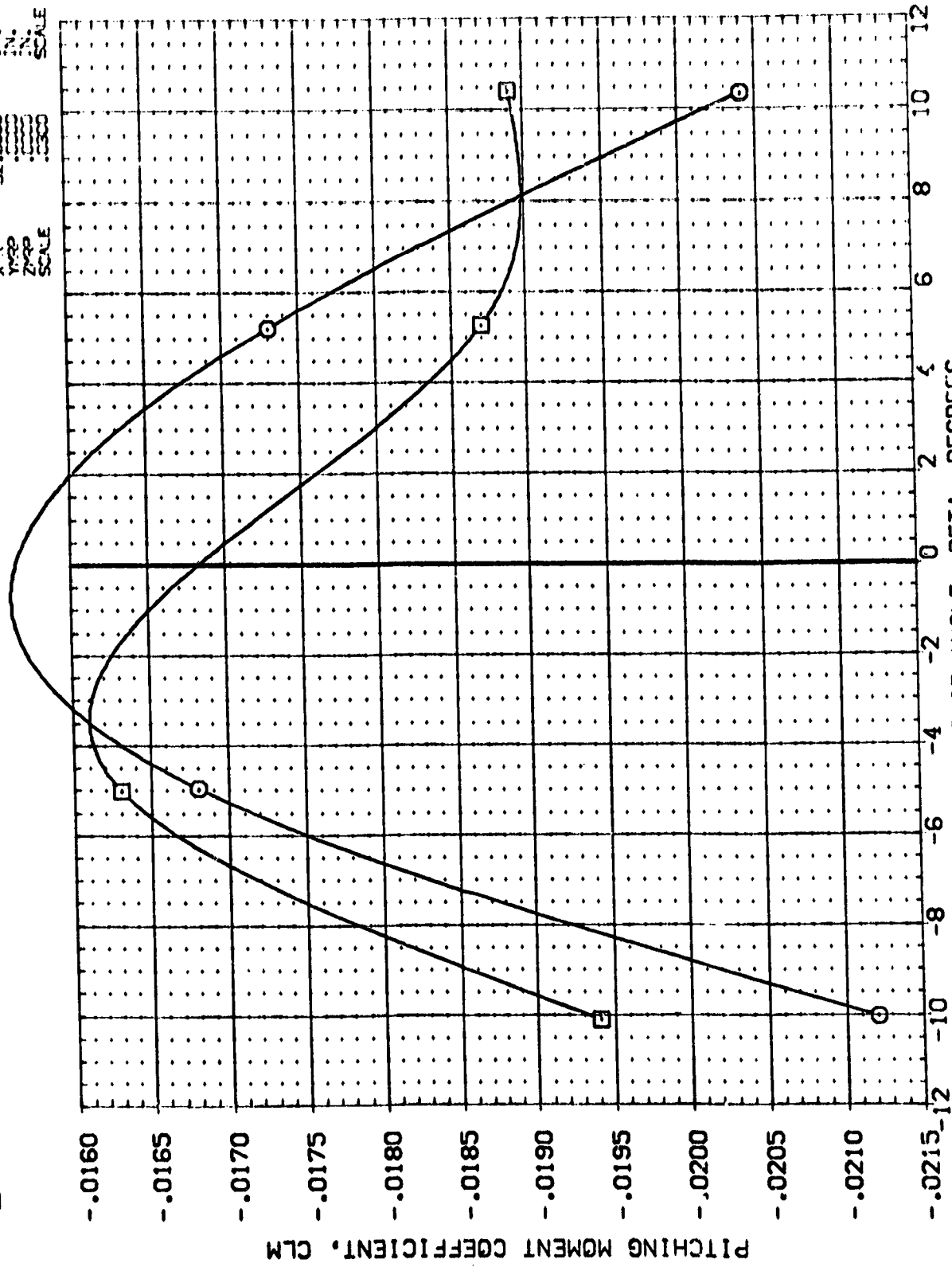


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902

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(R3PC06)

AMES 11-707 0A12 02A

MACH .599 ALPHA .000
 .902 RUDDER .000 ELEVON .000
 RUDFLR .000

REFERENCE INFORMATION
 SPEC 2.4212
 LREF 28.8450
 BREF 28.8450
 YREF 32.3000
 ZREF 0.0000
 SCALE 1.0000

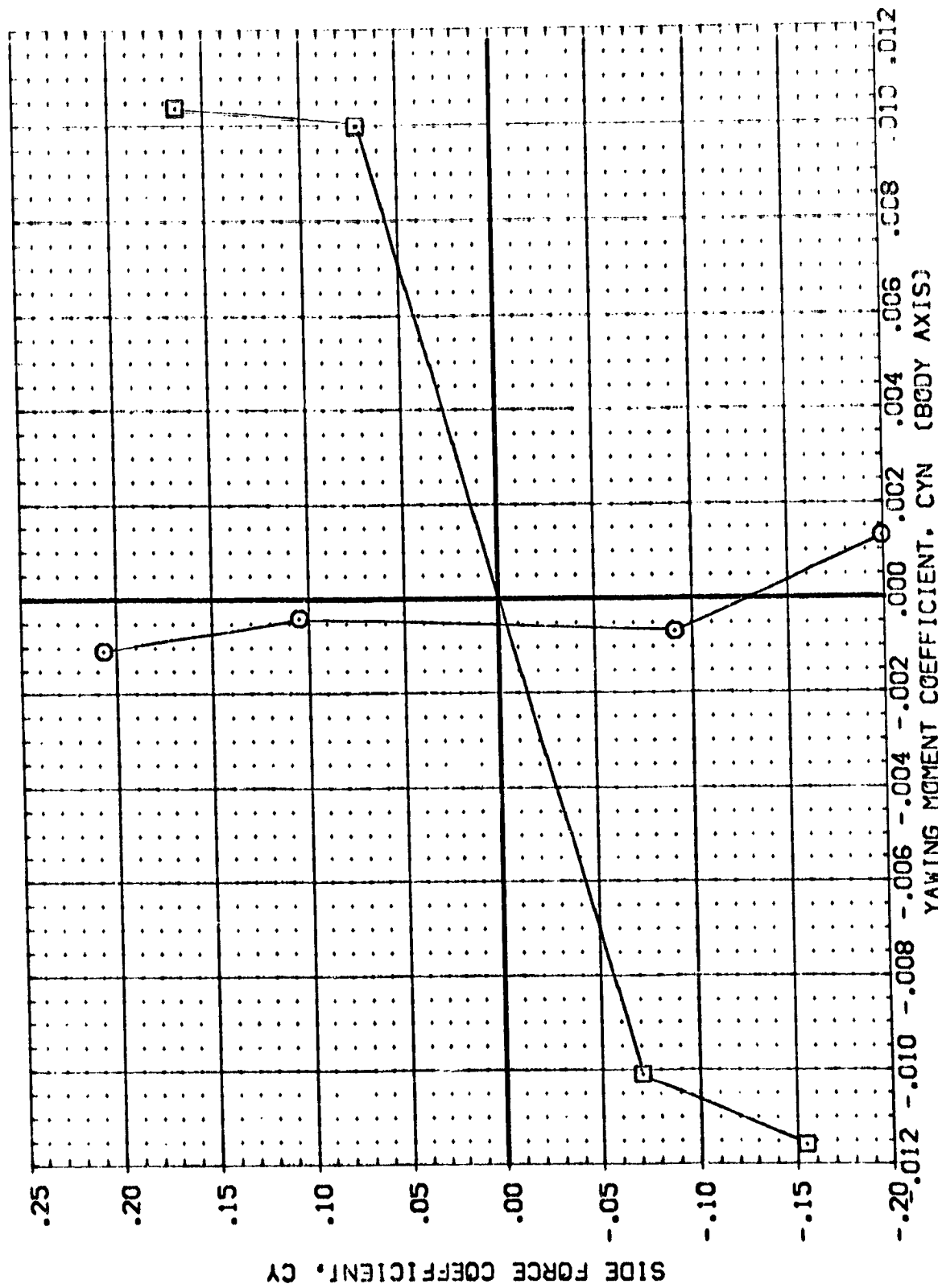


FIG.9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., MN=0.599,0.902

(ABPDCG)

SYNCO

206.
205.
204.

ALPHA
ROGER

PARAMETRIC VALUES	
20.000	ELEVON
.000	RJOF LR

REFERENCE INFORMATION	
SPEC	242:0
REF	39:0
REF	39:0
XREF	39:0
XREF	39:0
XREF	39:0
SCALE	39:0

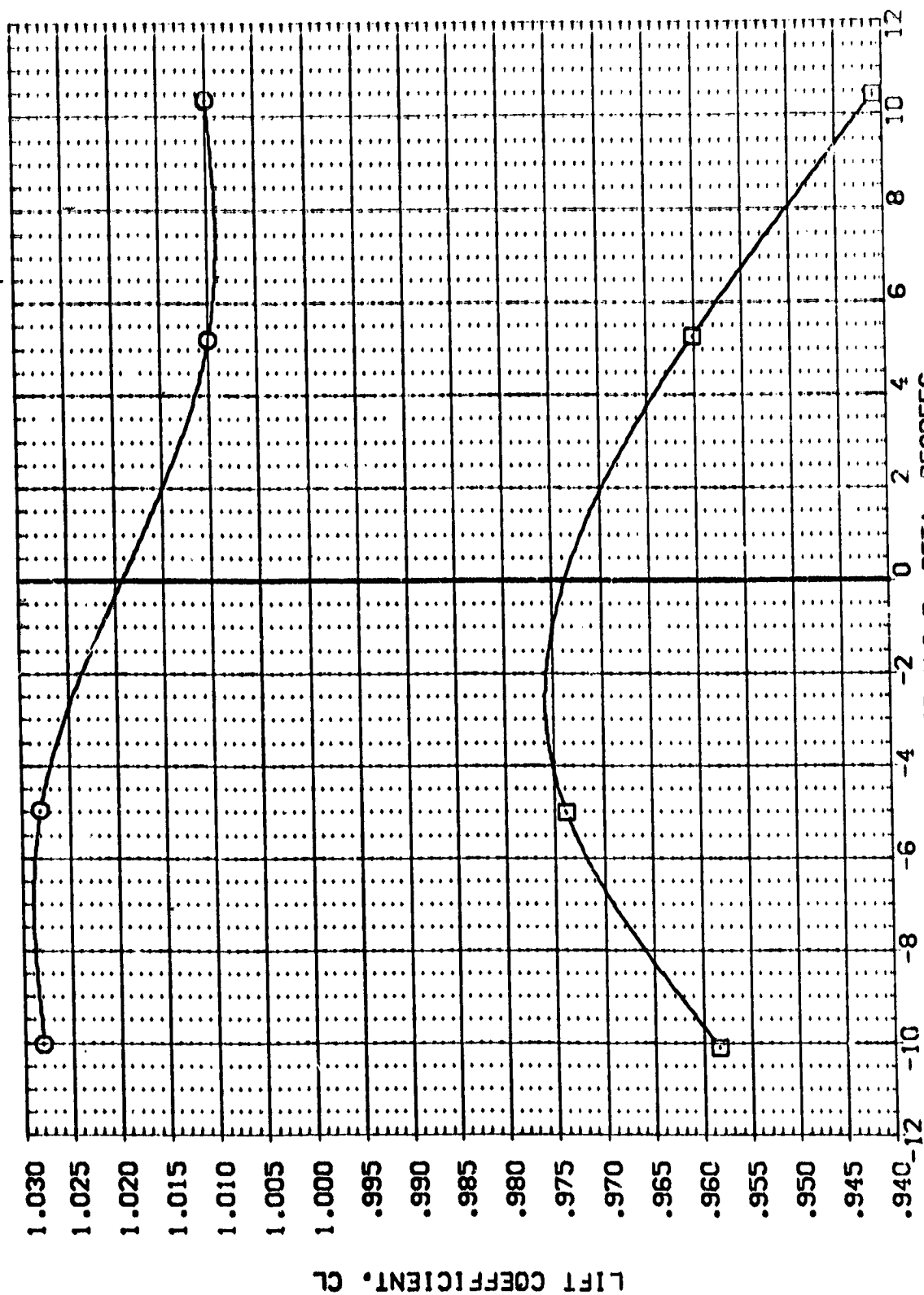


FIG. 9 ORBITER LATERAL-DIRECTIONAL DATA AT ALPHA=20 DEGS., $M_N=0.599$, $C.902$

AMES 11-707 0A12 02A

00
-857

ICV/bi

632

ALPHA
RUBBER

PARAMETRIC VALUES
.000 ELEVEN
-10.000 RUOFLR

11

SECRET

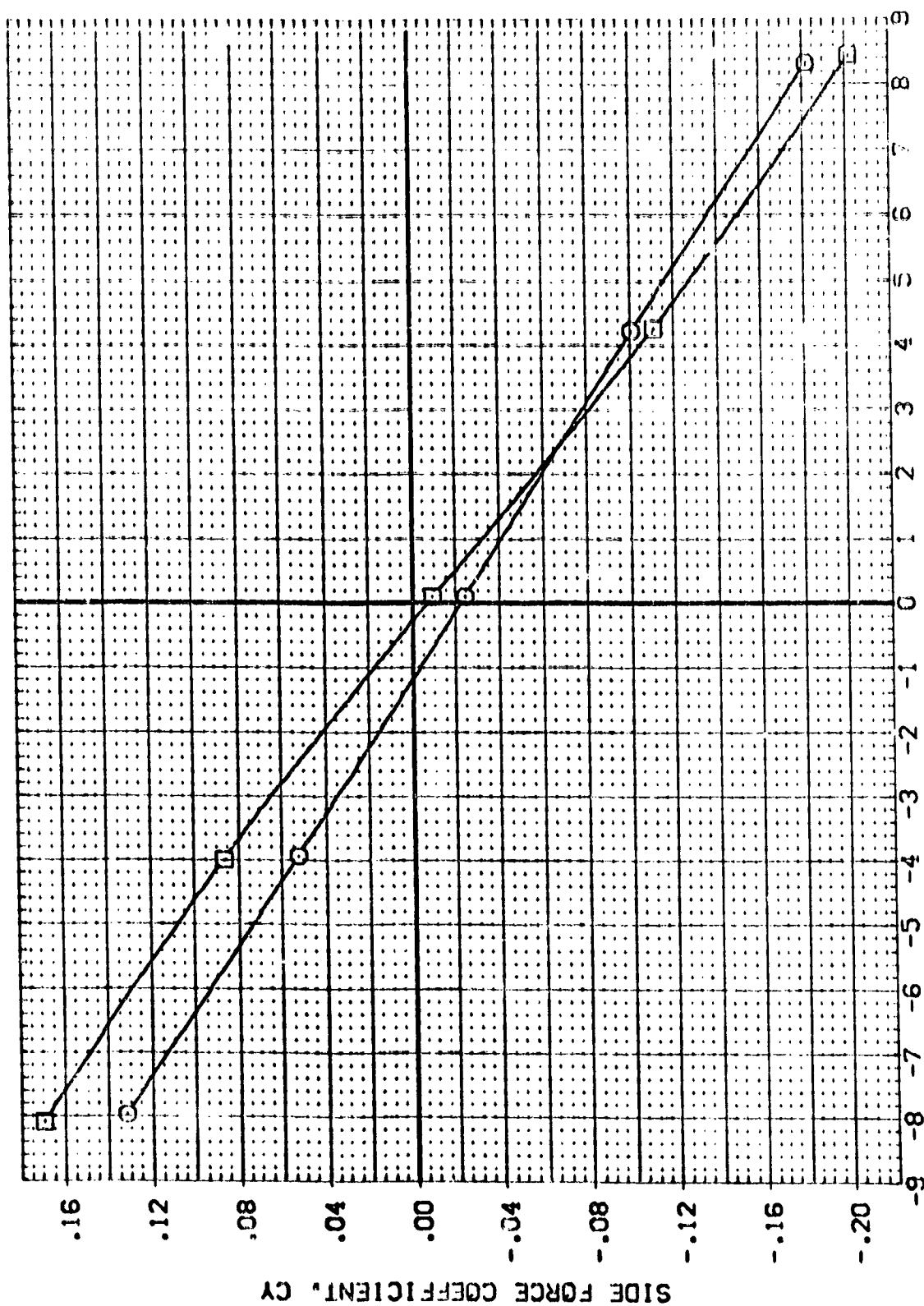
[illegible]

FIG. 10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., VN=0.600, C.902

==

(RBPO007)

AMES 11-707 0A12 02A

SYMBOL		MACH	PARAMETRIC VALUES			
			ALPHA	RUDDER	ELEVON	RUDFLR
□		.600			.000	.000
○		.902		-10.000		

REFERENCE INFORMATION

	SG.FT.
SREF	2.4210
LREF	39.8490
BREF	39.8490
XPRP	32.3000
YPRP	.0000
ZPRP	.0000
SCALE	.0300

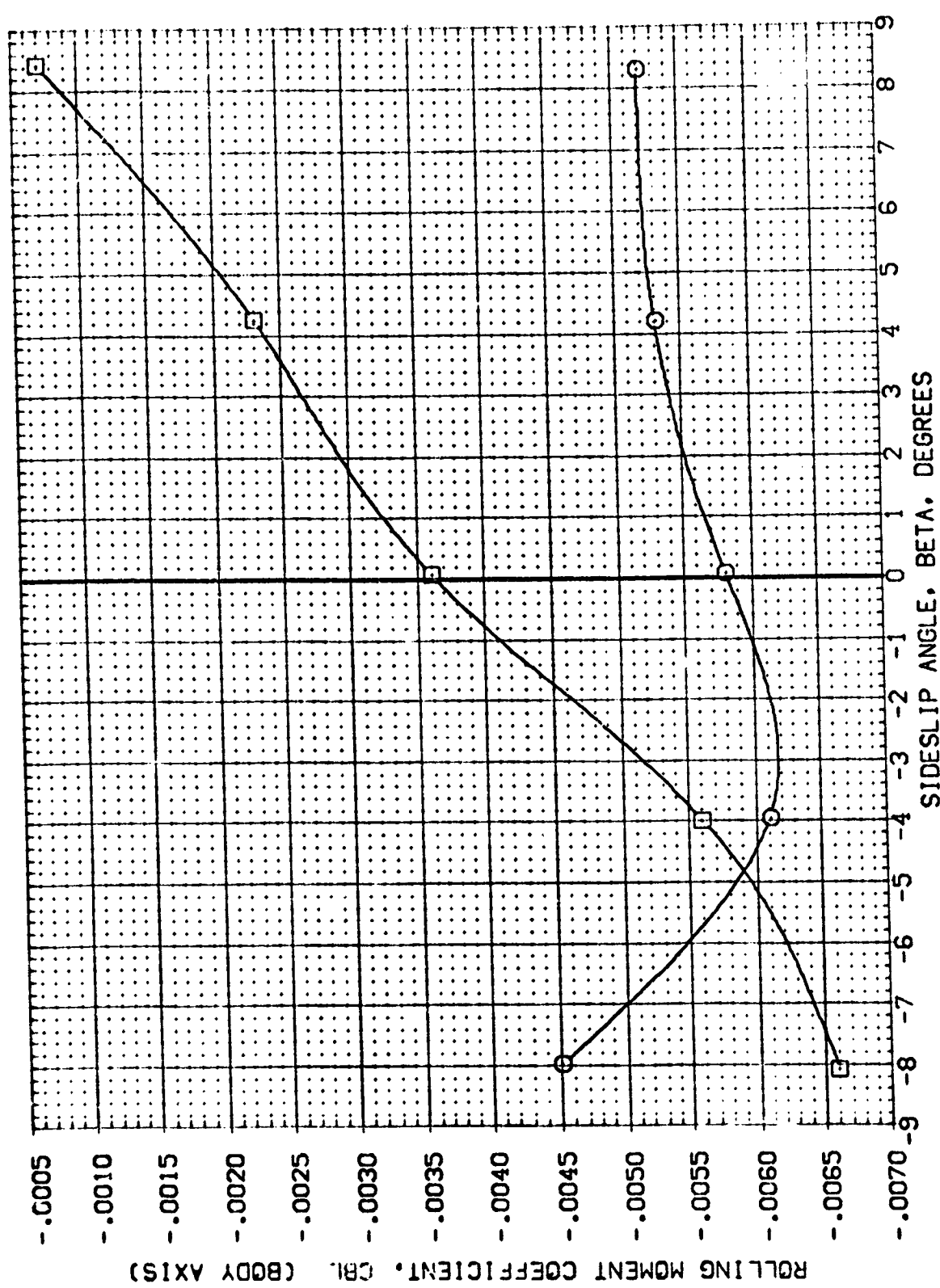


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600,0.902



AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .600 .000 ELEVON .000
□ .902 -10.000 RUOFLR .000

(RBP0007)

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XREF 32.3000 IN.
YREF .0000 IN.
ZREF .0000 IN.
SCALE .0300

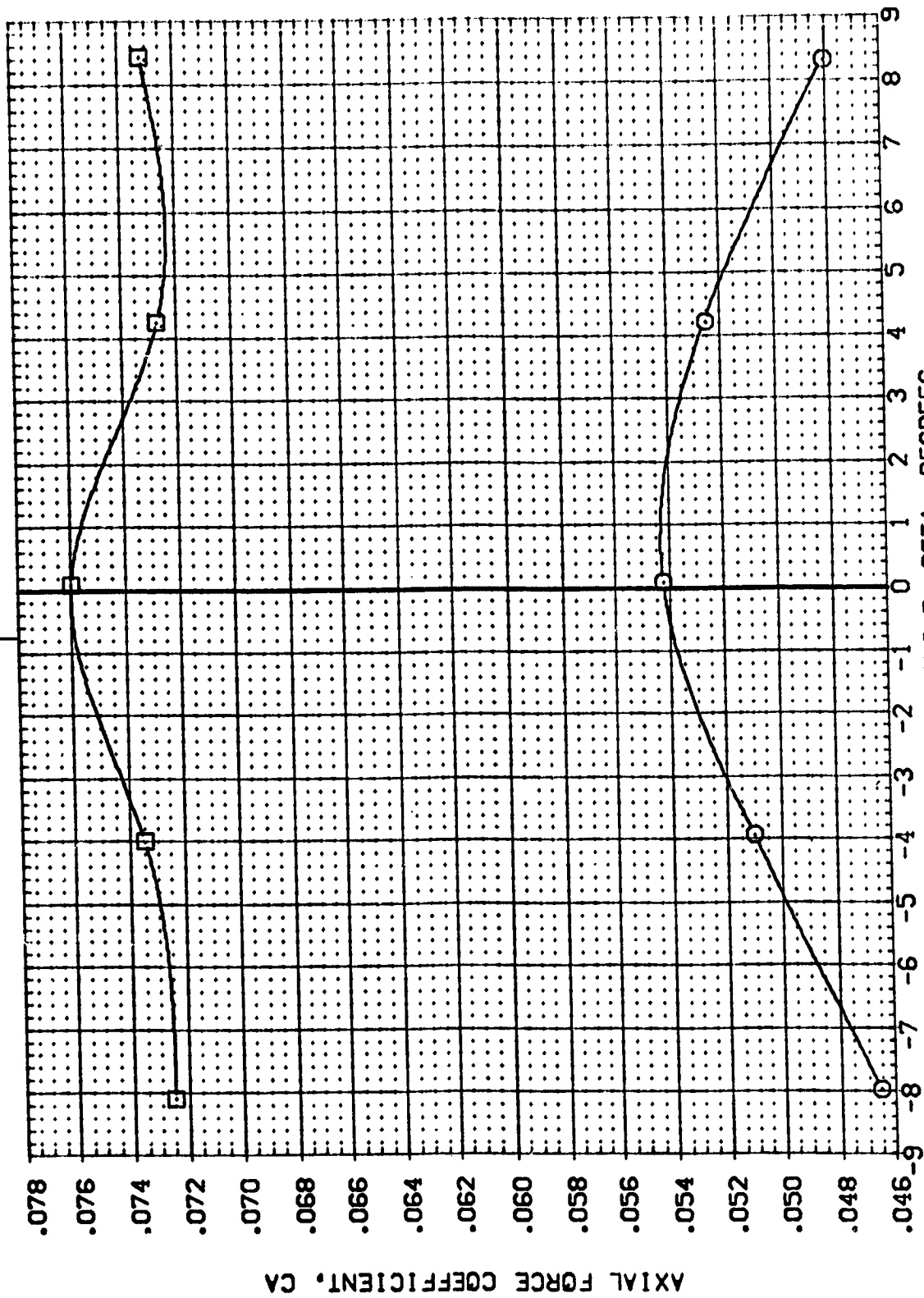


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600,0.902
SIDESLIP ANGLE, BETA, DEGREES



(RBPC007)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .600 .902
 □ .000 .000

PARAMETRIC VALUES
 ELEVON .000
 RUDDER -10.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 35.8490
 BREF 38.8490
 AREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0000

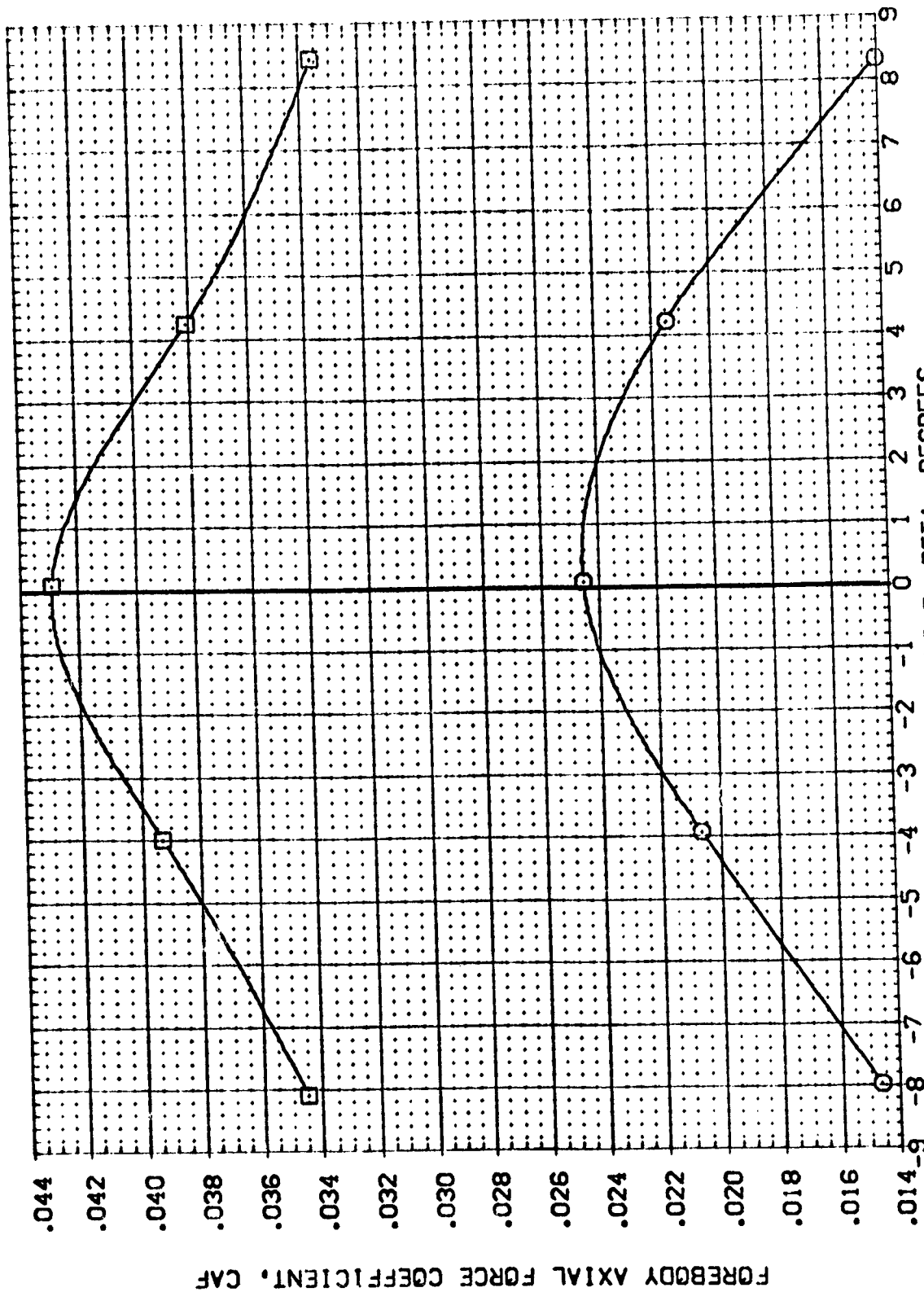


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600, 0.902

AMES 11-707 0A12 02A

(RBP007)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
○	.600		.000 ELEVEN	SREF 2.4210 SQ.FT.
□	.502	RUDDER	-10.000 RUOFLR	LREF 39.8490 IN.
				BREF 39.8490 IN.
				XREF 32.3000 IN.
				YREF .0000 IN.
				ZREF .0000 IN.
				SCALE .0300

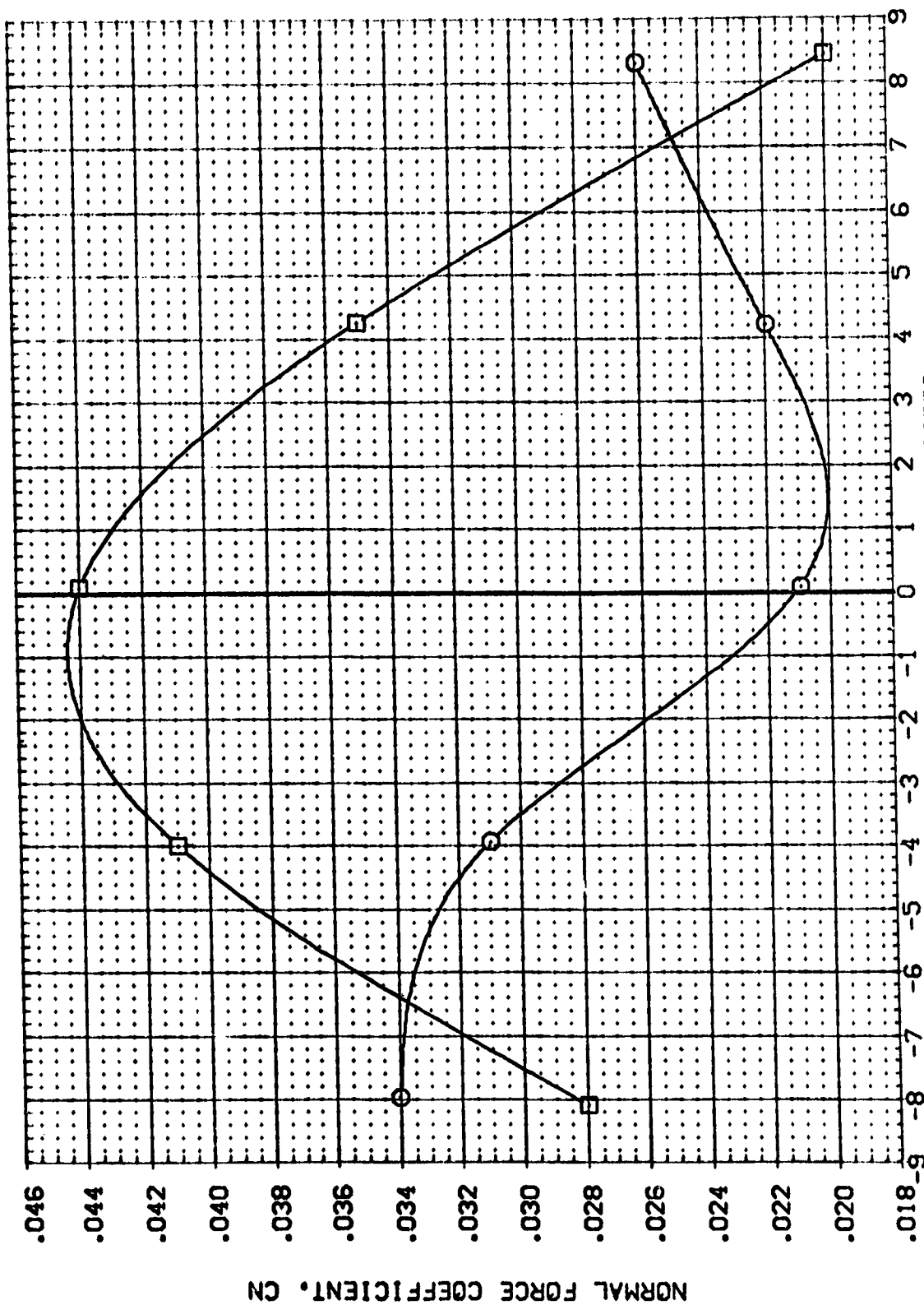


FIG.10 ORBITER LAT-OIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600, 0.902

(R8P007)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
○ .500 .000 .000
□ .902 -10.000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8490
BREF 38.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0000

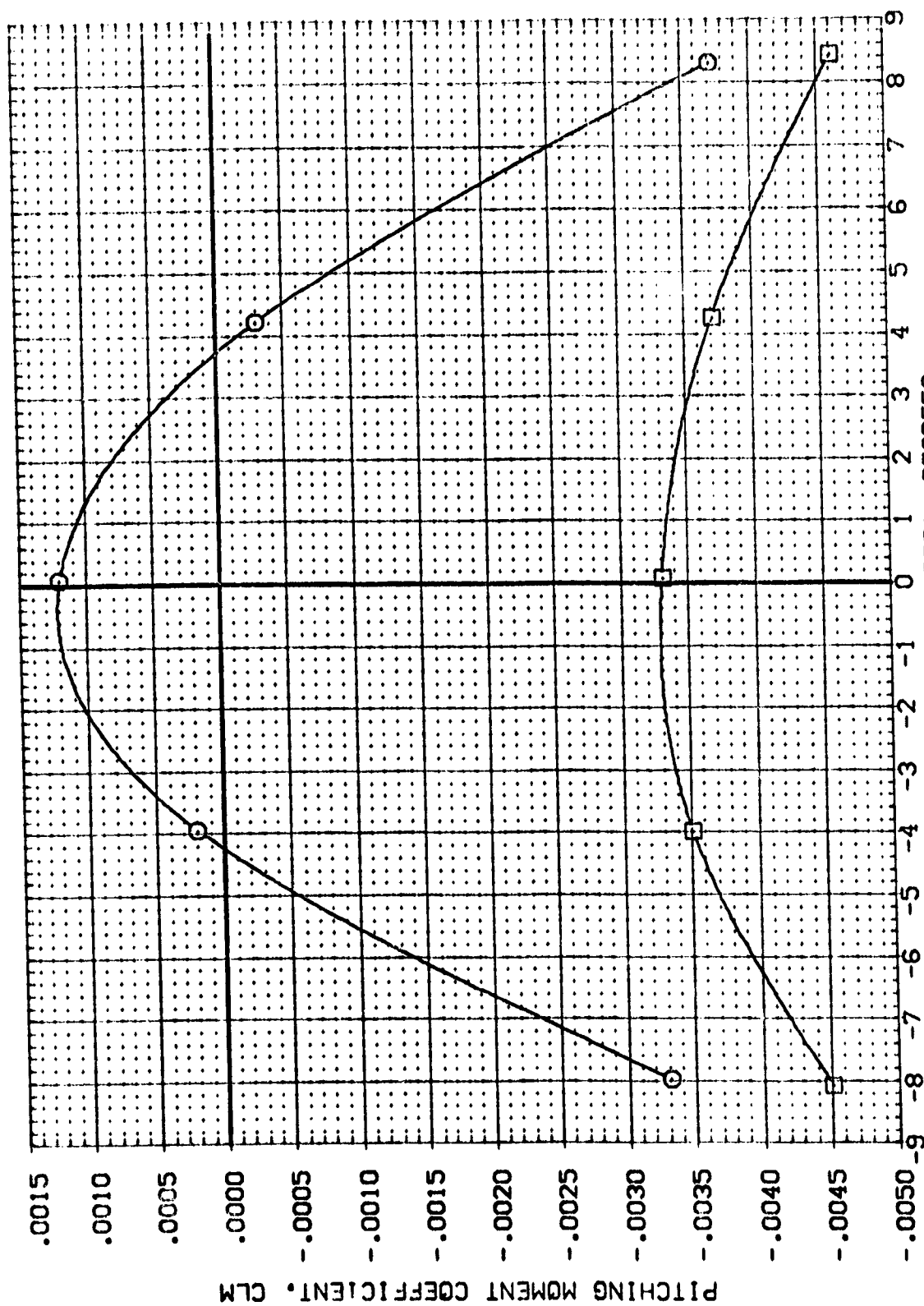


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600,0.902

(RBP007)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 O .600 .000 ELEVEN .000
 □ .902 -10.000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8450 IN.
 BREF 38.8450 IN.
 XGRP 32.3000 IN.
 YGRP 1.0000 IN.
 ZGRP 1.0000 IN.
 SCALE .0300

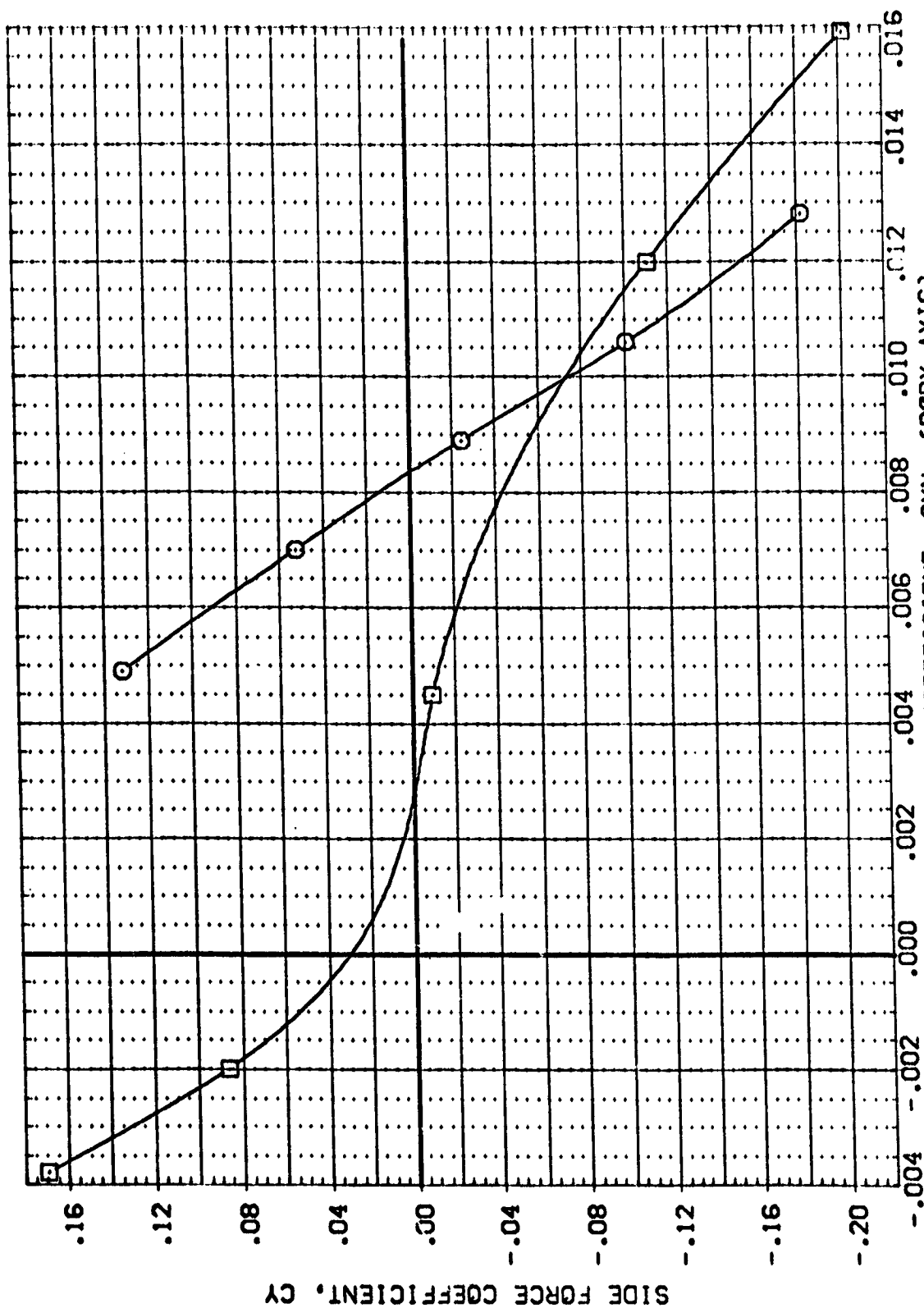


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600,0.902



AVES 11-707 0A12 02A

(ABP007)

SYMBOL MACH ALPHA RUDDER .000 ELEVON .000
 □ .902 -10.000 RUJFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 38.8450
 BREF 38.8450
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

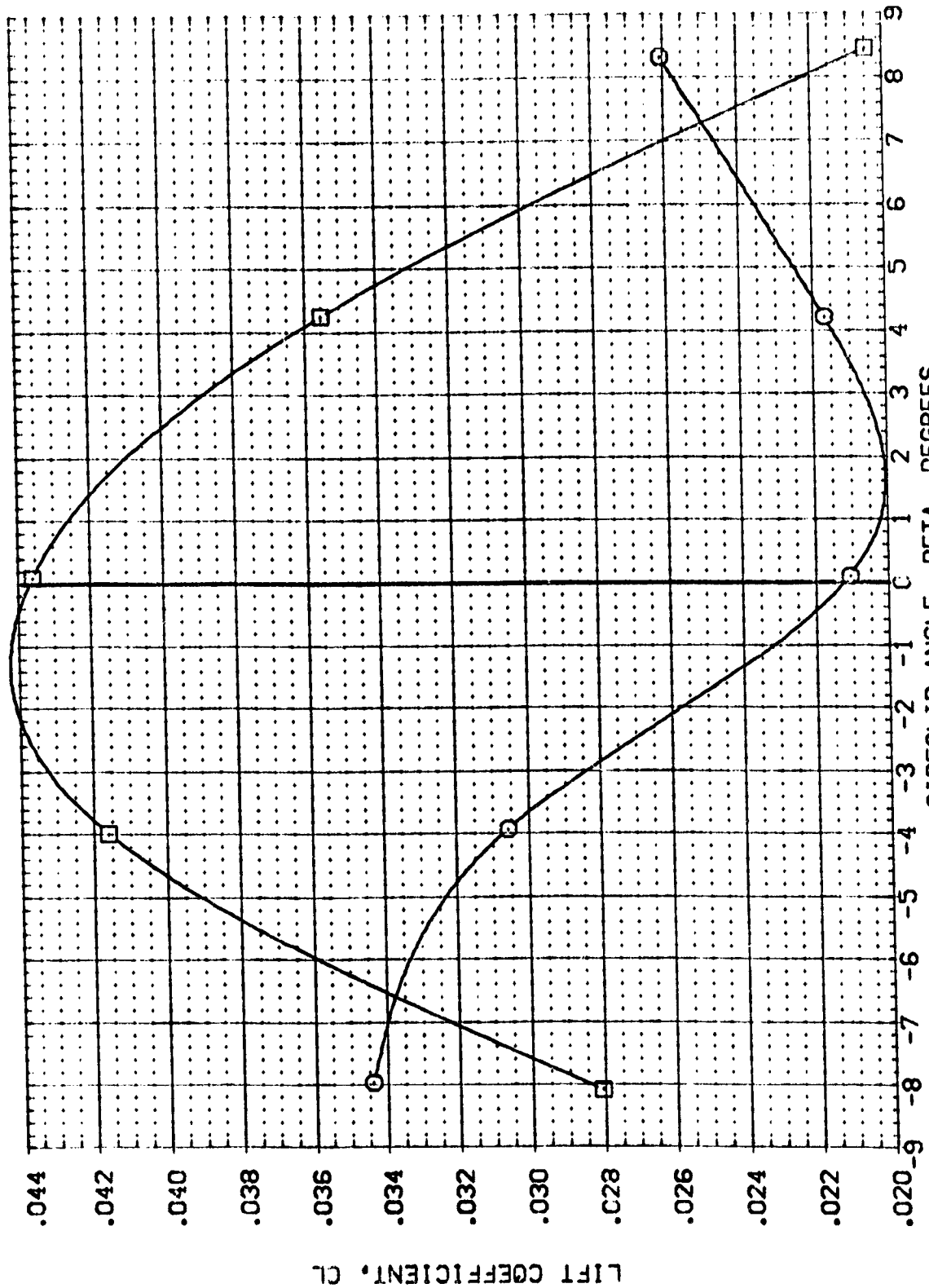


FIG.10 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-10 DEGS., MN=0.600, 0.902
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 62



AMES 11-707 GA12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
	.601 .901	ALPHA RUDDER	ELEVON RUOFLR
		5.000 -10.000	.000 .000

(RBP008)

REFERENCE INFORMATION

SREF	2.4210	SQ.FT.
LREF	39.8550	IN.
BREF	39.8490	IN.
XPRP	32.3000	IN.
YPRP	.0000	IN.
ZPRP	.0000	IN.
SCALE	.0300	SCALE

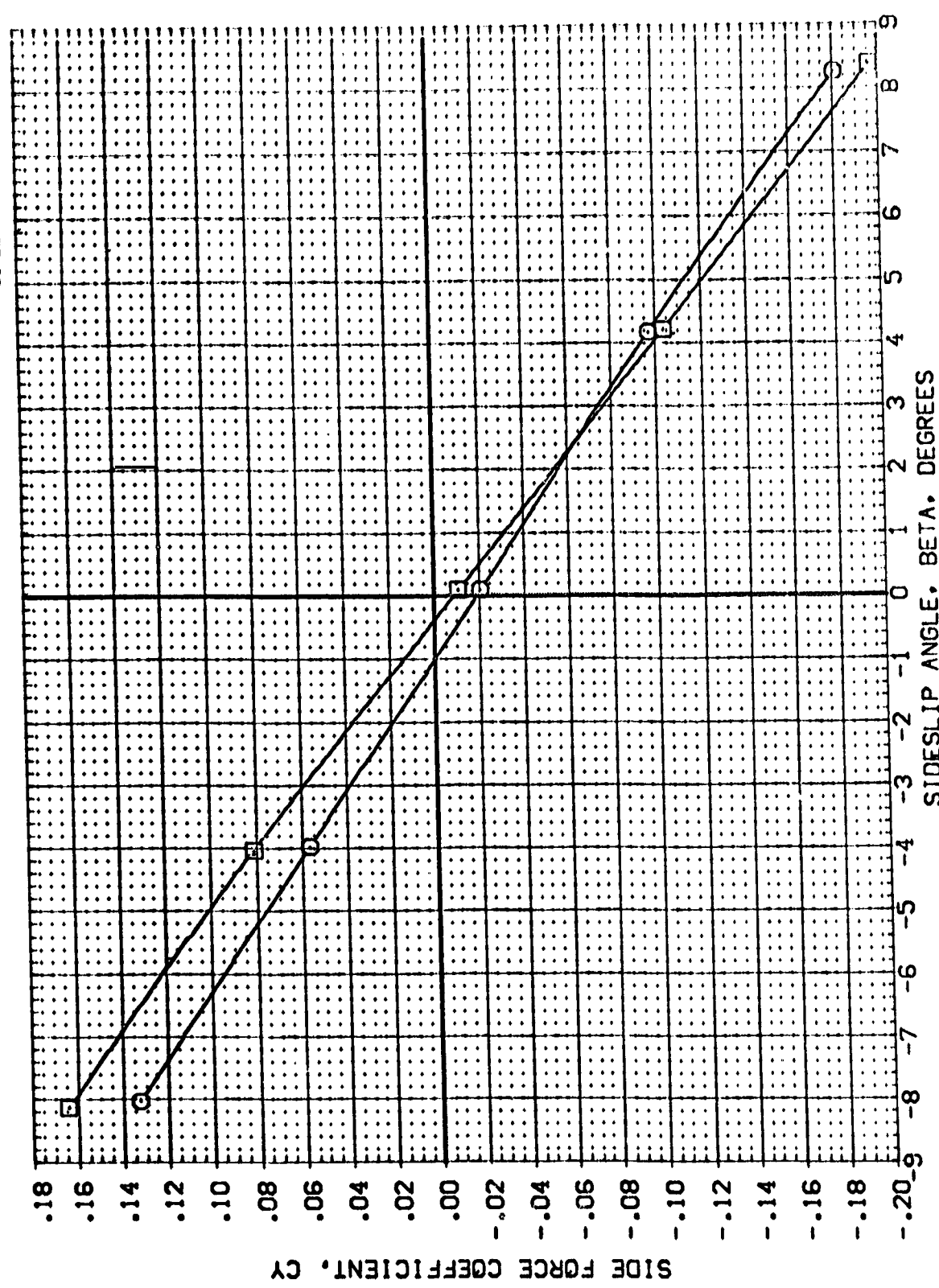


FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., MN=0.601,0.901

III

(RBPC008)

AMES :1-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
 .50: ALPHA 5.000 ELEVON .000
 .50: RUDDER -10.000 RUOFLR .000

REFERENCE INFORMATION
 SRGE 2.4210
 LREF 28.8450
 ERGE 28.8450
 XMRP 32.5000
 YMRP 1.0000
 ZMRP 1.0000
 SCALE 1.0000

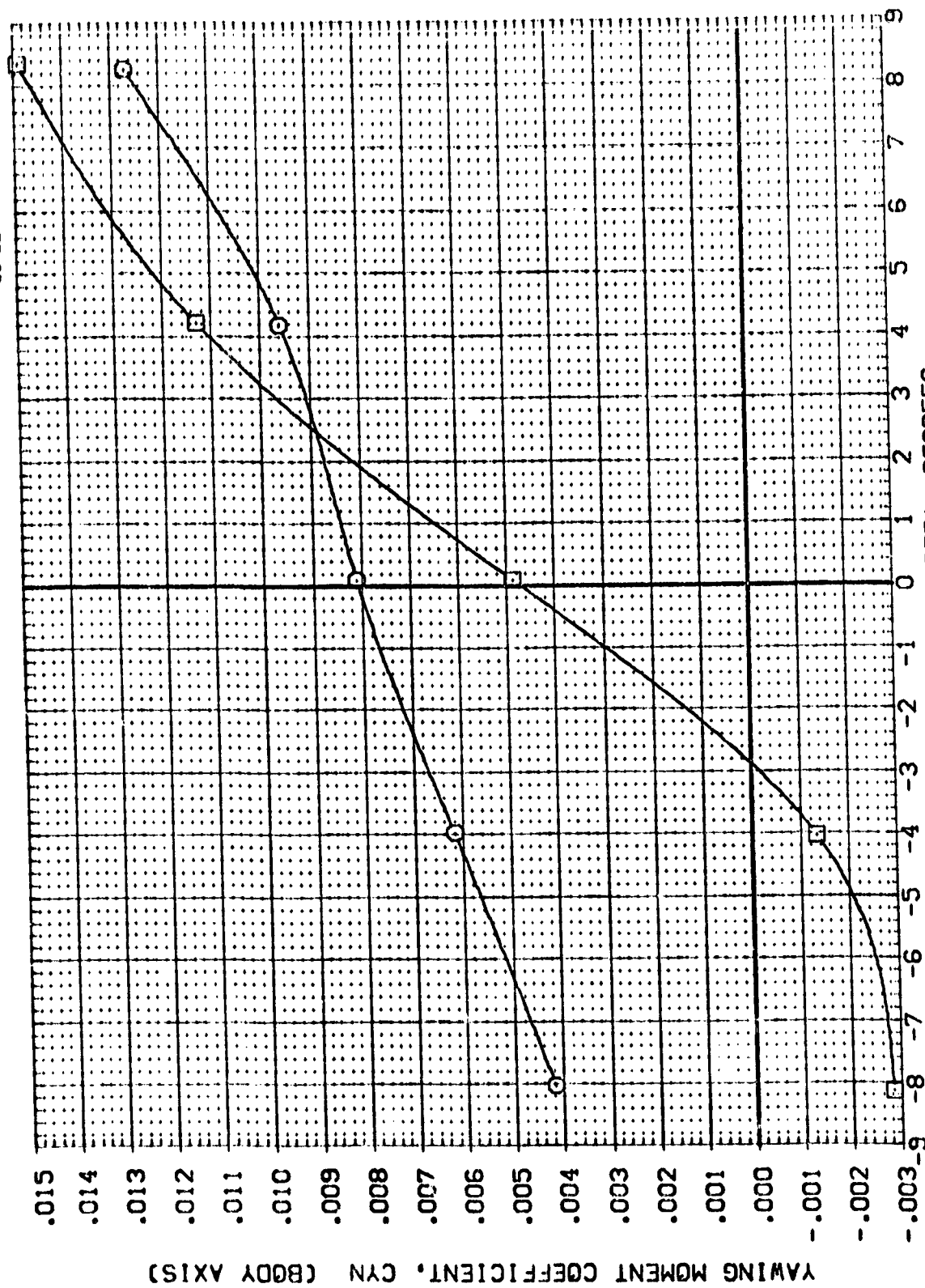


FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., $MN=0.601, 0.901$

(RBP008)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
□ .501 ALPHA 5.000 ELEVON .000
□ .901 RUDDER -10.000 RUDDER .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
HREF 30.8490
SREF 30.8490
XREF 32.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.0000

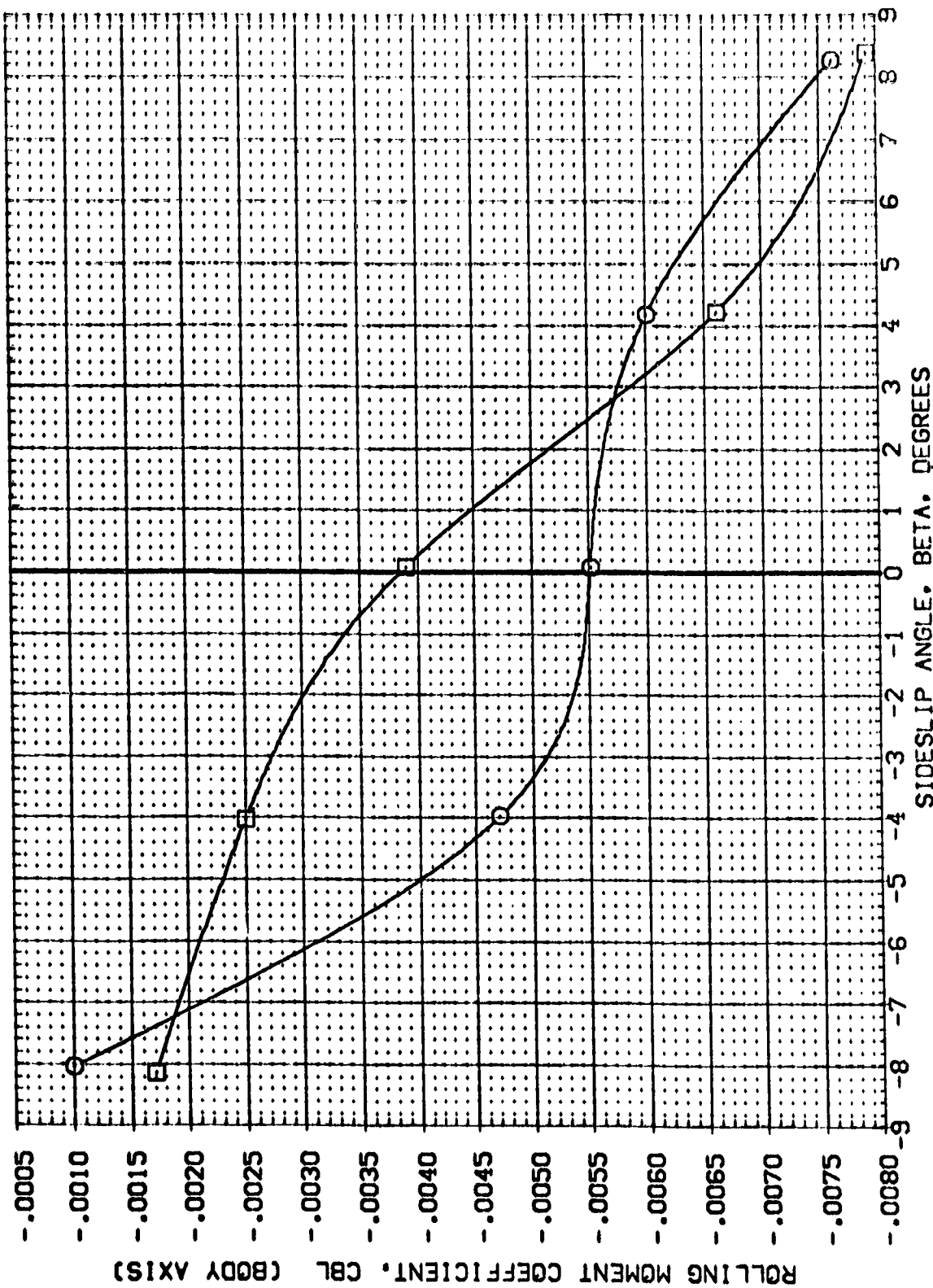


FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., MIN=0.601,0.901

≡

(R8P008)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
 .601 ALPHA 5.000 ELEVON .000
 .901 RUDDER -10.000 RUDDLR .000

REFERENCE INFORMATION
 SREF 2.4210 SCALE
 LREF 39.8460
 BREF 38.8460
 XREF 32.3000
 YREF 10.0000
 ZREF 10.0000
 SCALE .0000

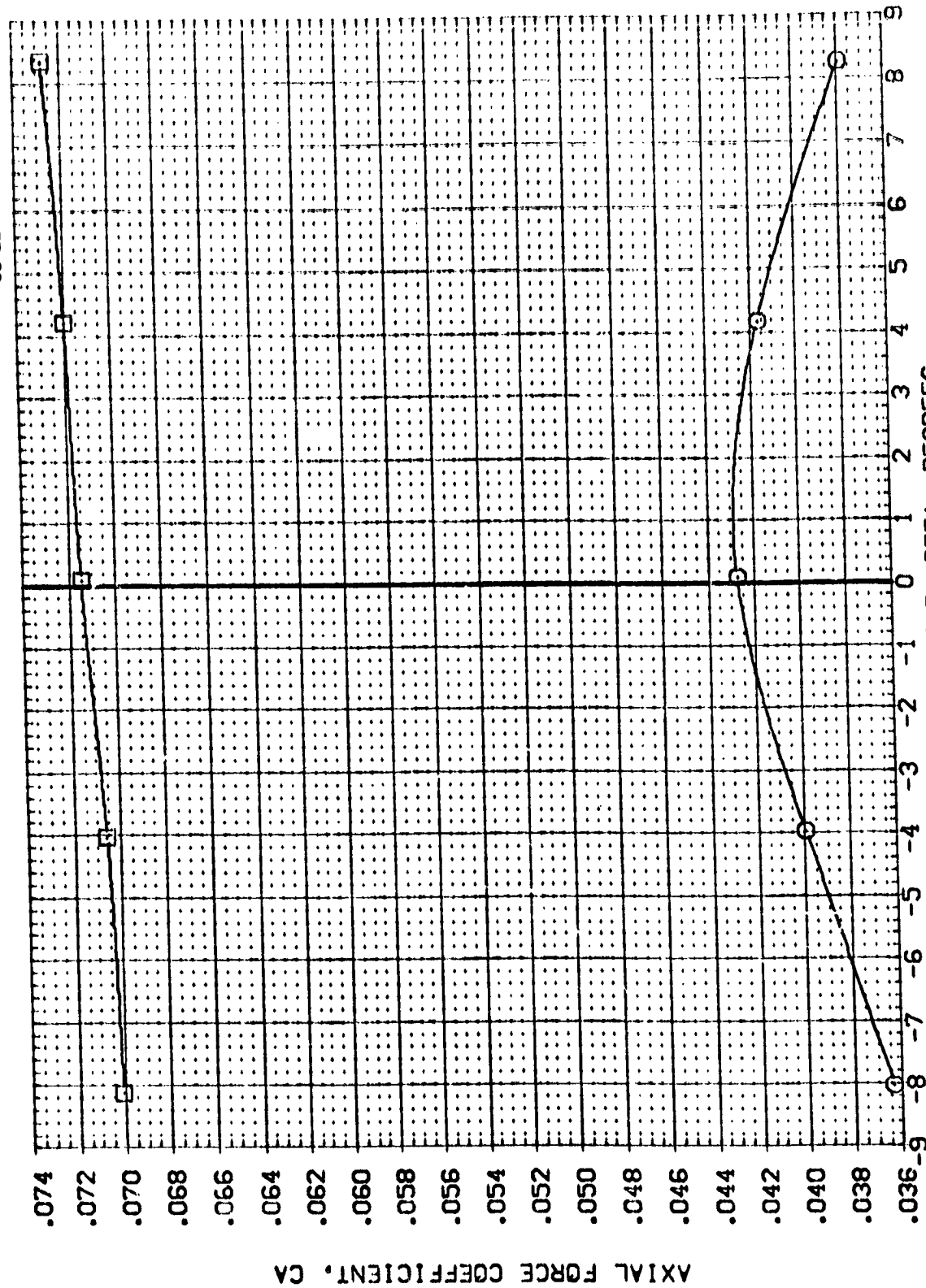


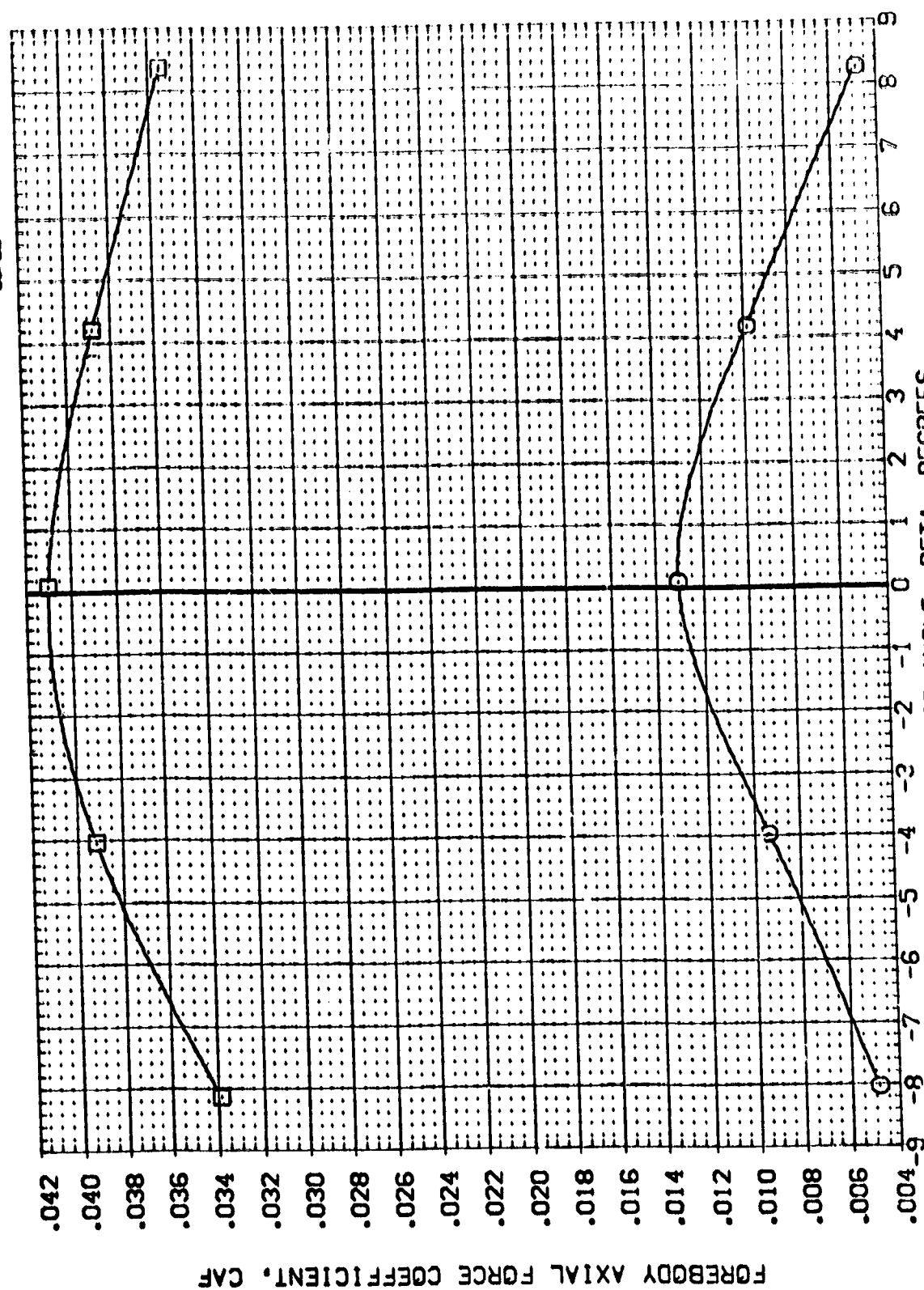
FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., $M=0.601, 0.901$

(RBP008)

AMES 11-707 CA12 02A

SYMBOL	MACH	PARAMETRIC VALUES		ELEVON	RUDDER	RUDFLR	.000	.000
		ALPHA	RUDDER					
□	.601	5.000	-10.000					
□	.901							

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.6450
BREF 38.6450
XREF 32.3000
YREF 0.0000
ZREF 0.0000
SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., $MN=0.601, 0.901$

(333002)

AMES 11-707 0A12 02A

SYMBOL MACH .601
 PARAMETRIC VALUES
 ALPHA 5.000 ELEVON .000
 RUDDER -10.000 RUDDER .000

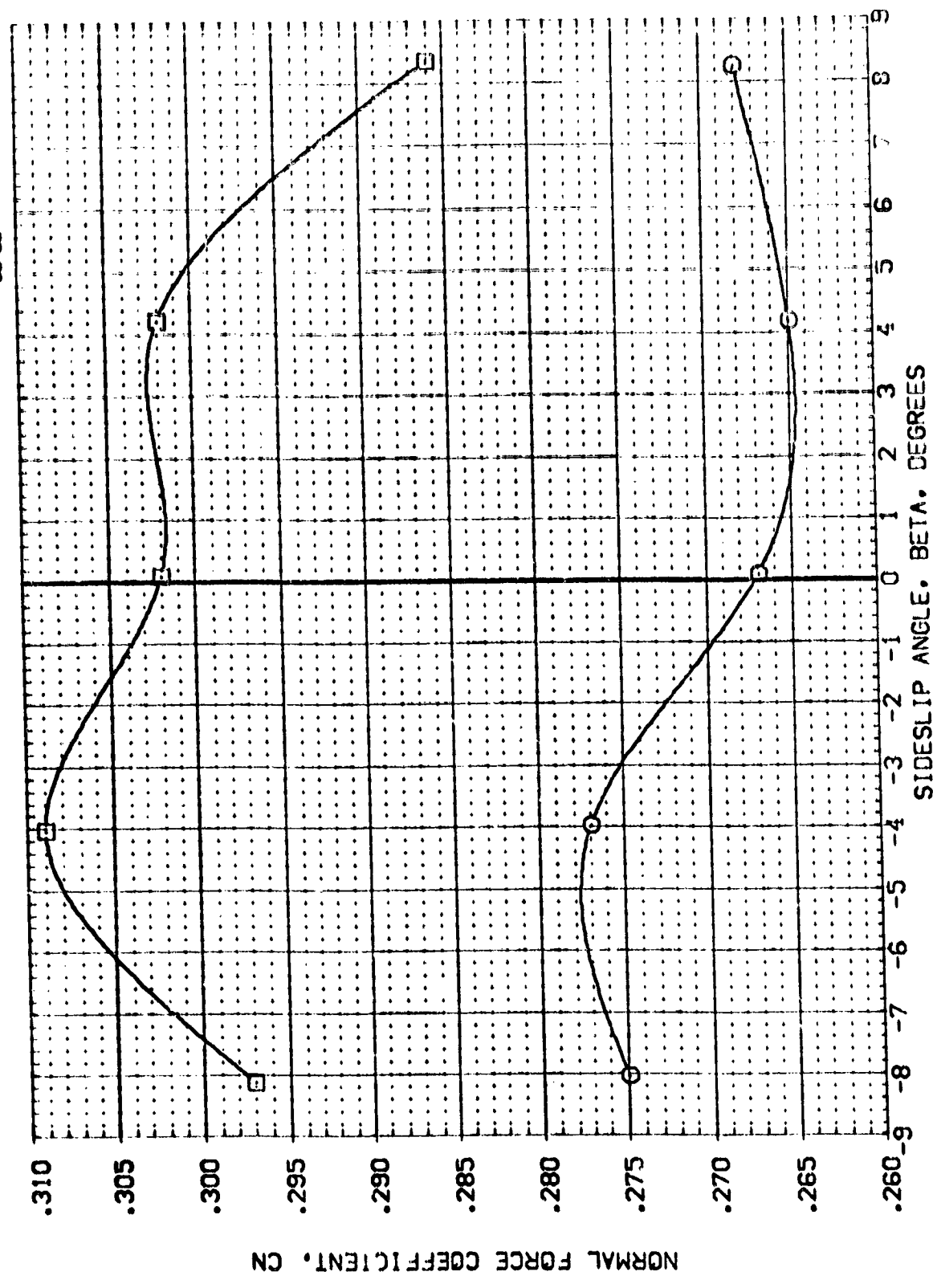


FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., MN=0.601, 0.901

(RBP008)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		SQ.FT.
		ALPHA	ELEVON	
□	.50	5.000	.000	
○	.90	-10.000	.000	

REFERENCE INFORMATION

SREF	2.4210
LREF	39.8490
BREF	39.8490
XMRP	32.5000
YMRP	.0000
ZMRP	.0000
SCALE	.0000

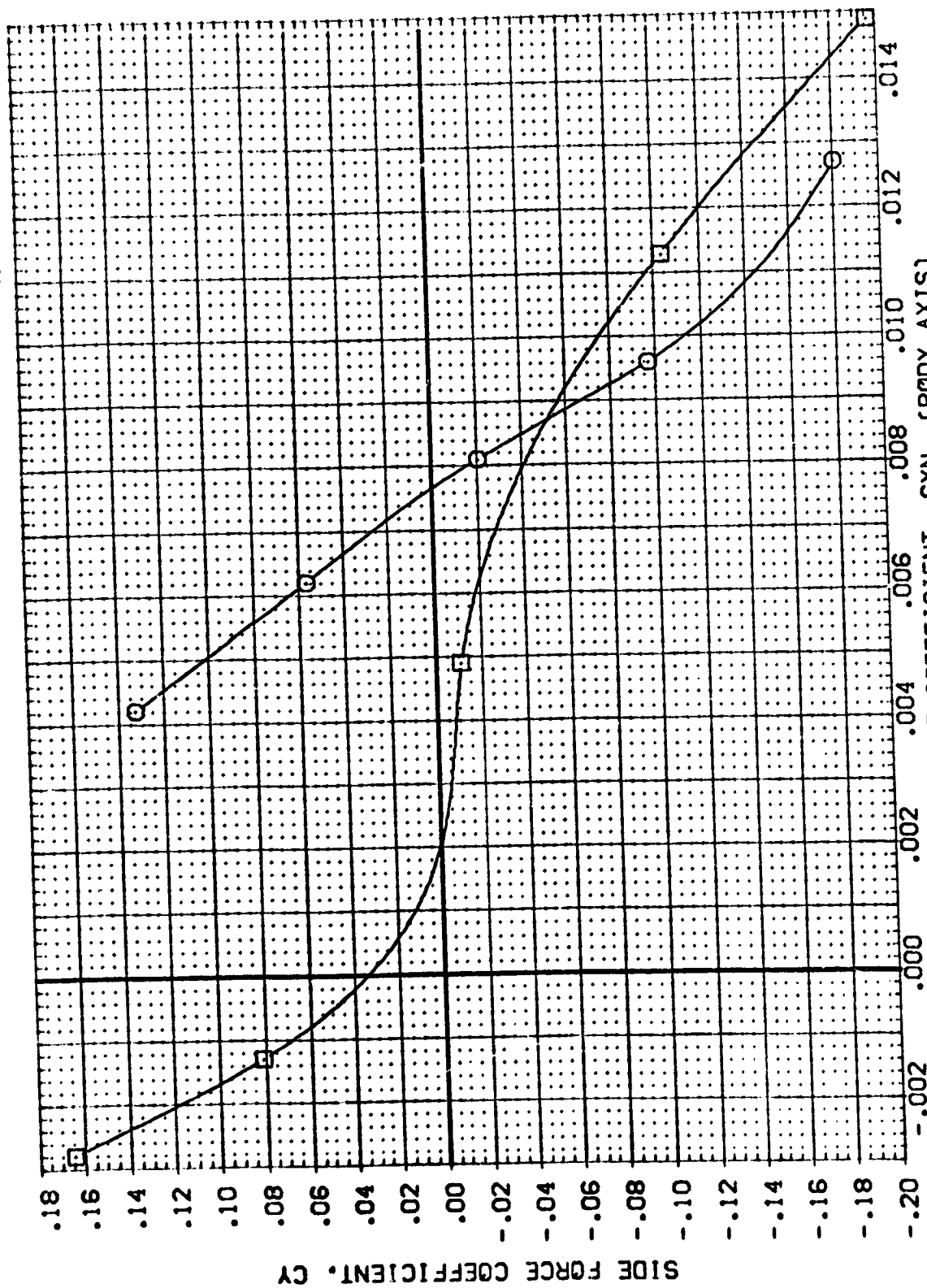


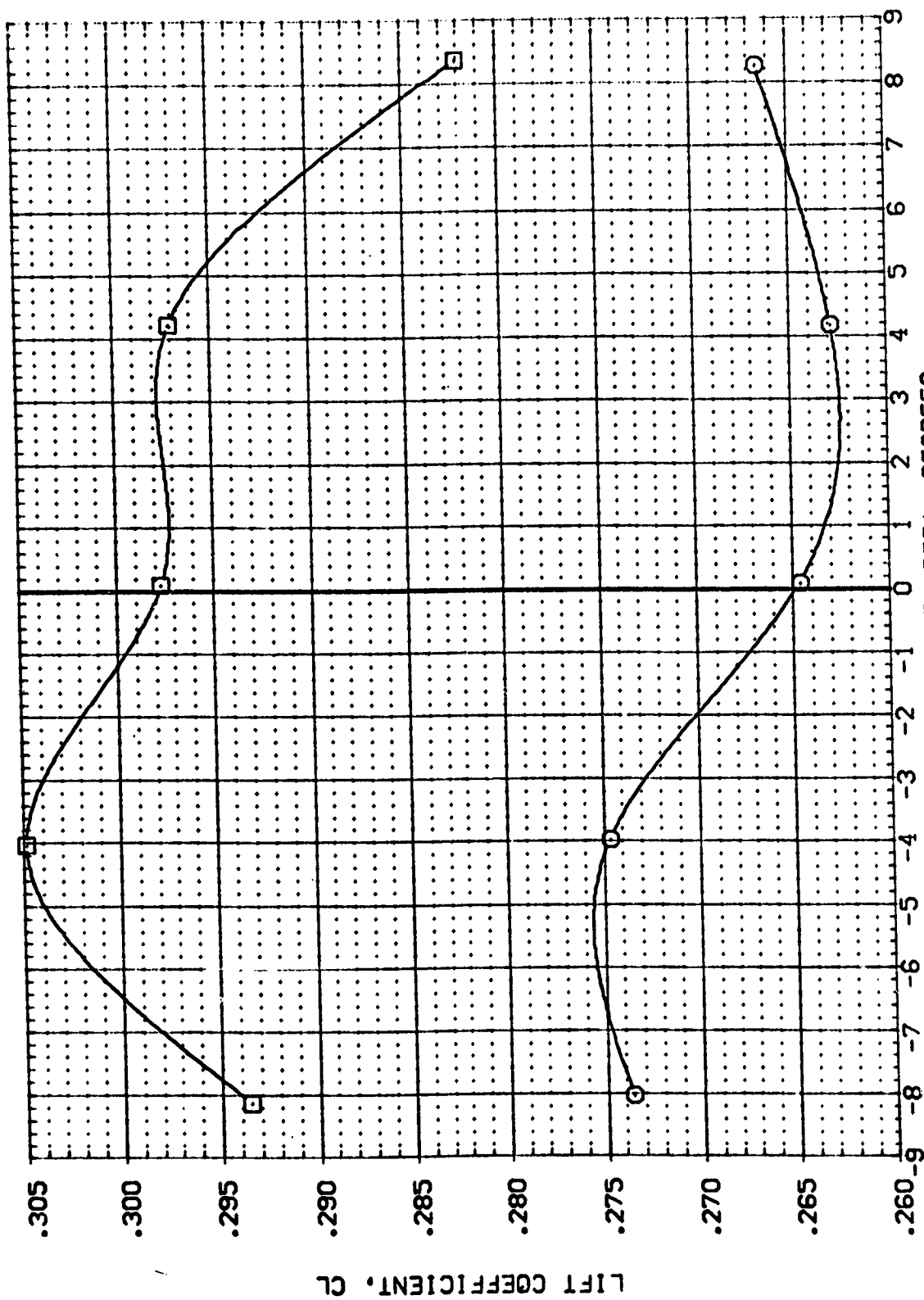
FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., MN=0.601, 0.901

[ABP008]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
☐ .601 .901 5.000 ELEVON .000
☐ .501 -10.000 RUDDFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8490 IN.
 BREF 38.8490 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.11 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-10 DEGS., MN=0.601,0.901

(RBP009)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		
		ALPHA	ELEVON	RUDDER
○	.599	10.000	.000	.000
□	.500	-10.000	.000	.000

REFERENCE INFORMATION
SREF 2.42:0 SQ.FT.
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP 0.0000
ZPRP 0.0000
SCALE .0300

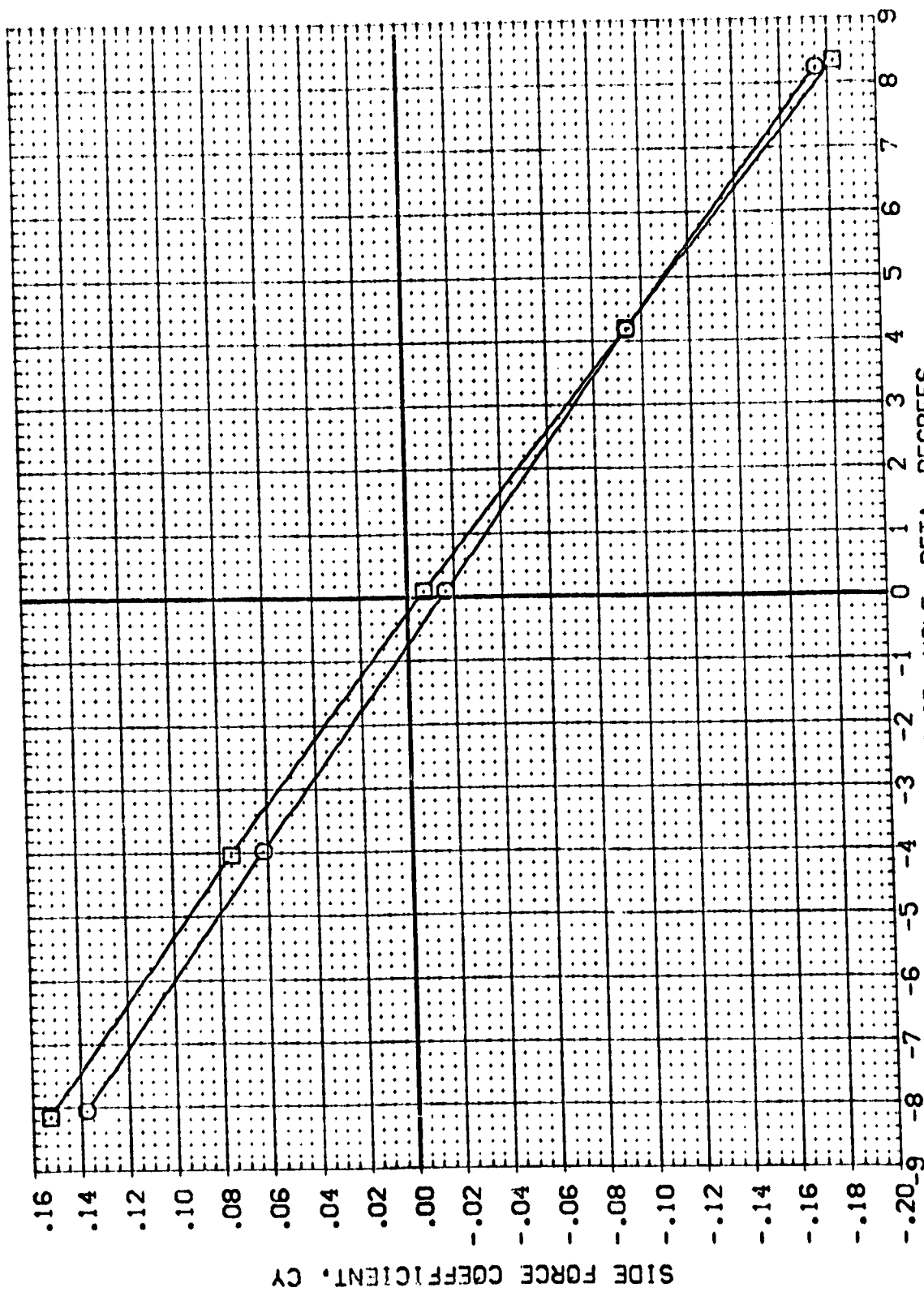


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MN=0.599,0.900



(RBP009)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .599 .000 ELEVON .000
□ .900 -10.000 RUDDLR

REFERENCE INFORMATION
SREF 2.4218 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

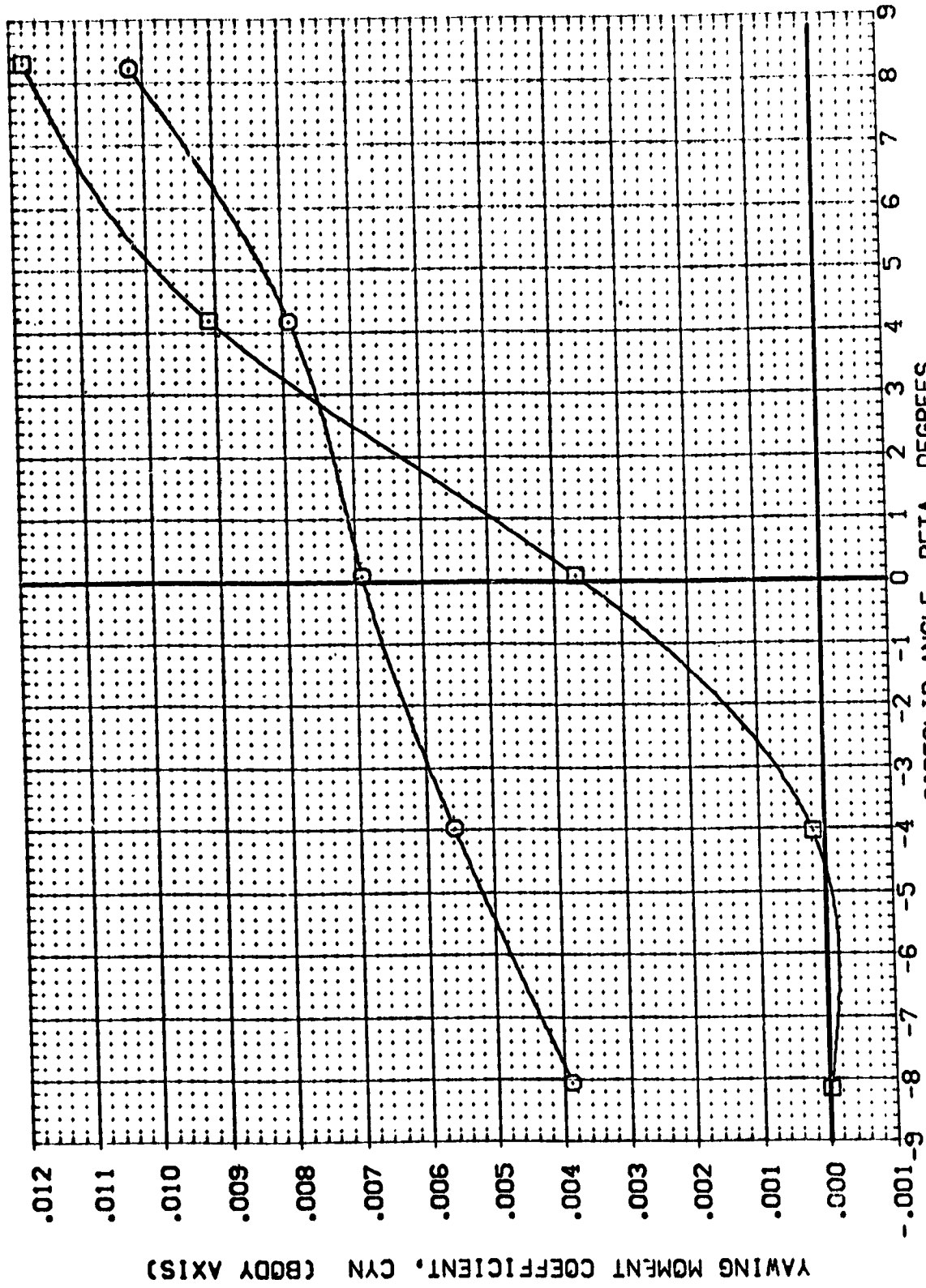


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MN=0.599, 0.900

[RBPO009]

AVES 11-707 0A12 02A

SYMBOL		MACH		PARAMETRIC VALUES	
○		.599	ALPHA	10.000	ELEVON
□		.900	RUDDER	-10.000	RUOFLR

REFERENCE INFORMATION

SREF	2.4210
LREF	38.8450
BREF	38.8450
XREF	32.3000
YREF	0.0000
ZREF	0.0000
SCALE	0.0001

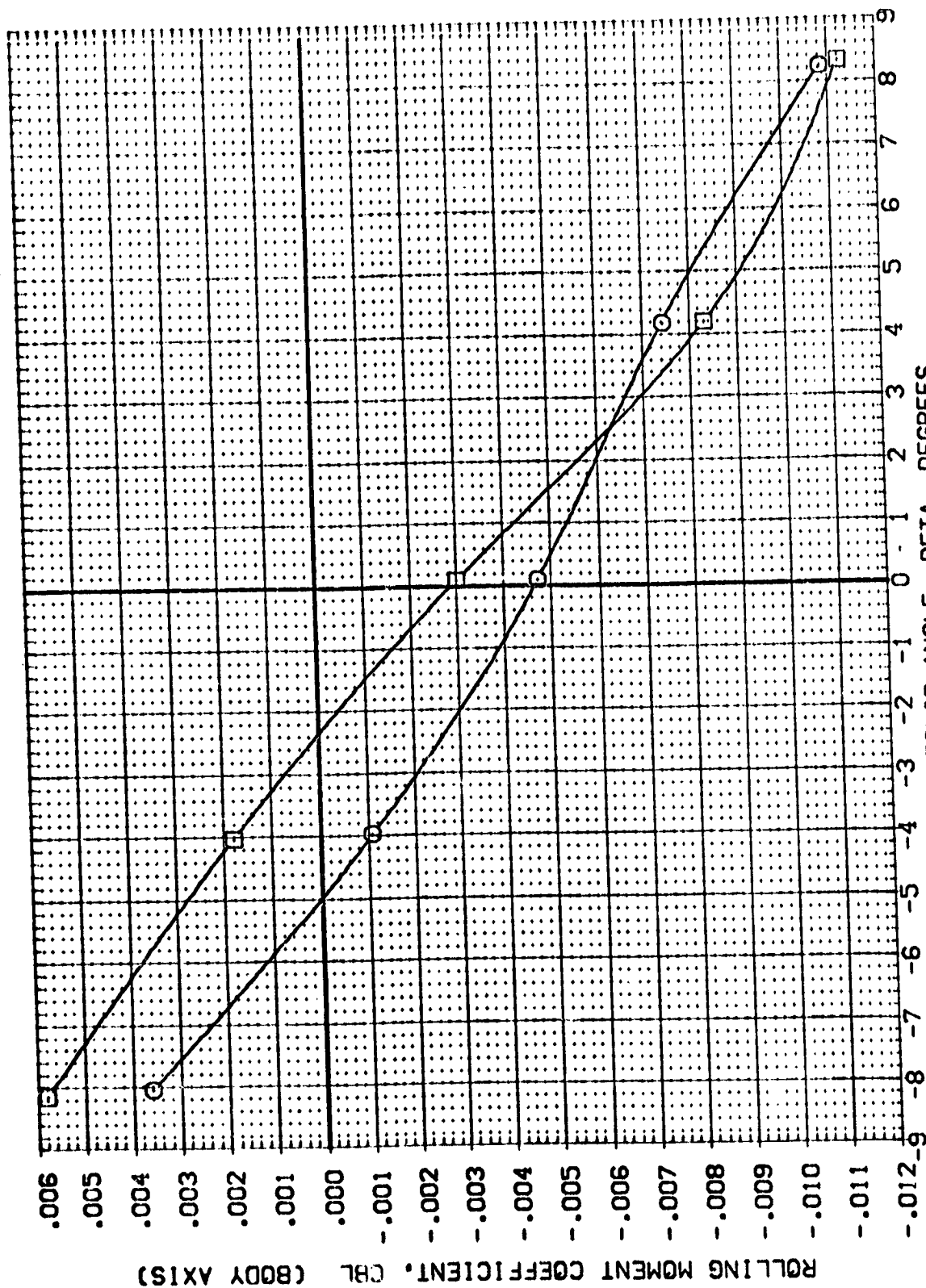


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., $\gamma_N=0.599, 0.900$

==

(RBPOC9)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		ALPHA	ELEV
○	.599	10.000	.000
□	.900	-10.000	.000

REFERENCE INFORMATION

SREF	2.4210	SO.FT.
LREF	39.8490	
BREF	39.8490	
YREF	32.3000	
XREF	0.0000	
ZREF	0.0000	
SCALE	0.0000	

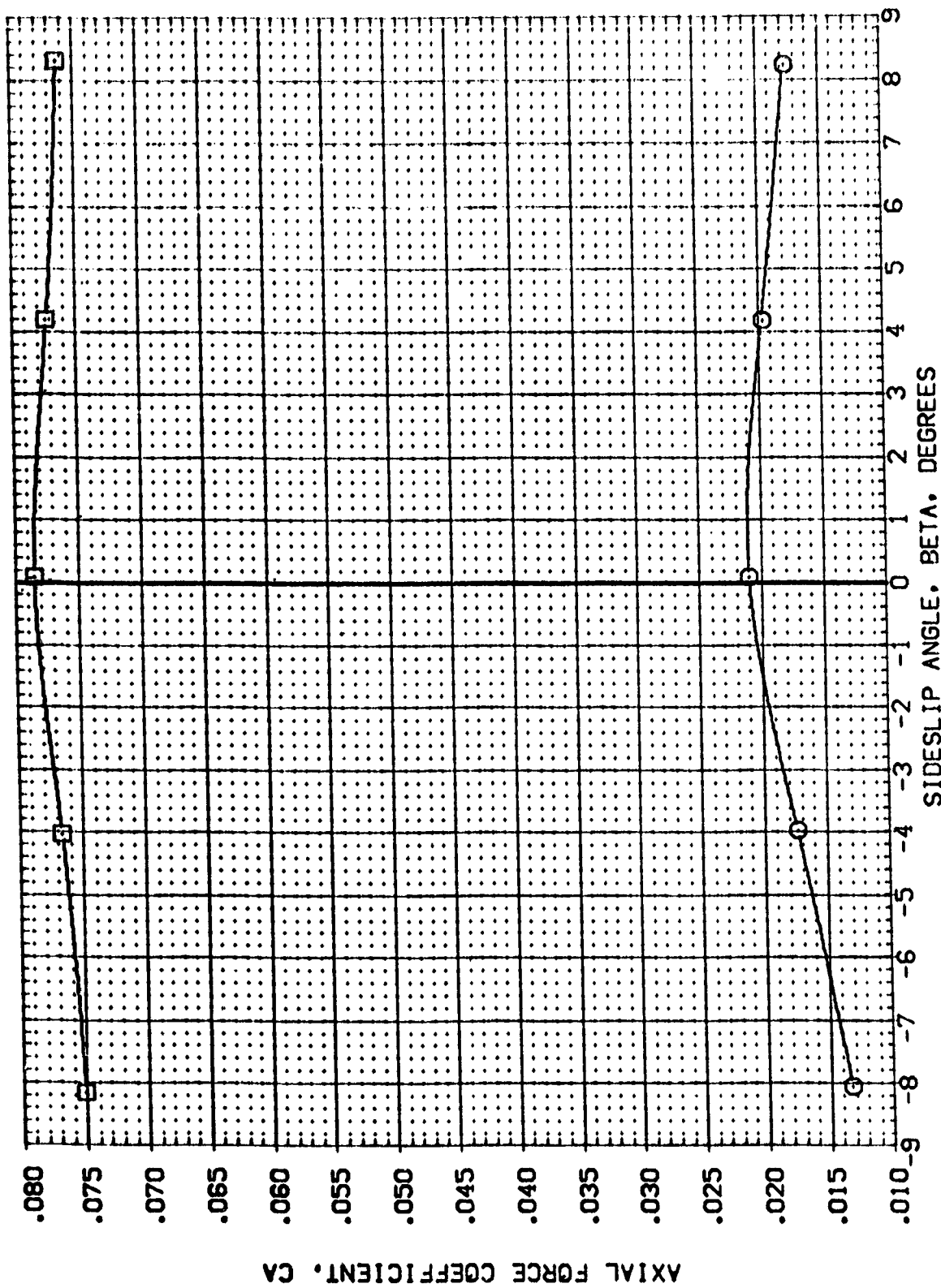


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MN=0.599,0.900

(RBP009)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
○ □ .599 10.000 ELEVEN .000
□ -10.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

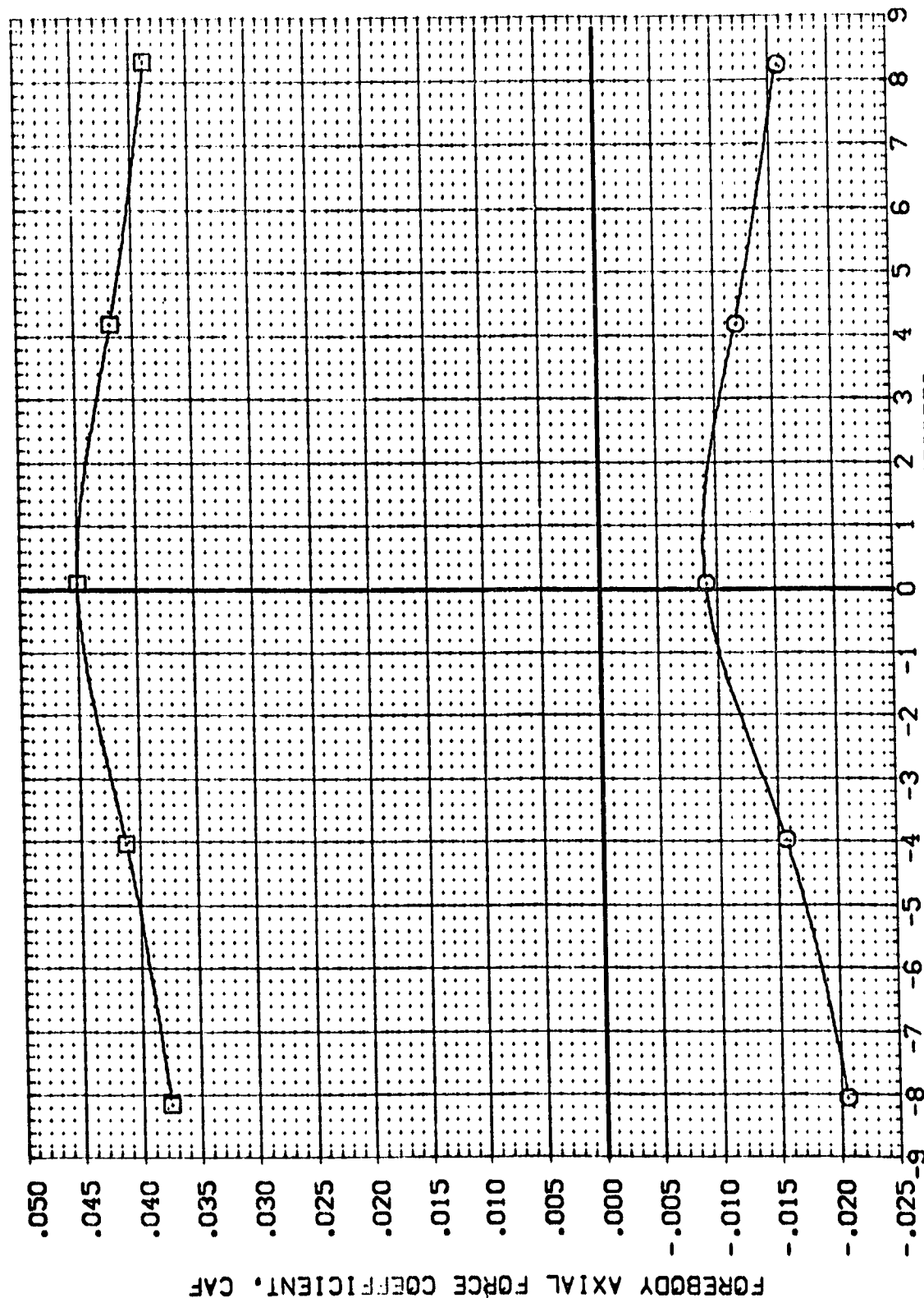


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MN=0.599,0.900



AMES 11-707 0A12 02A

(RBP009)

SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION
○	.599	ALPHA 10.000	SREF 2.4210
□	.900	ELEVON -10.000	LREF 39.8450
		RUDDER -10.000	BREF 39.8450
			XMREF 32.3000
			YMREF 0.0000
			ZMREF 0.0000
			SCALE 0.0000

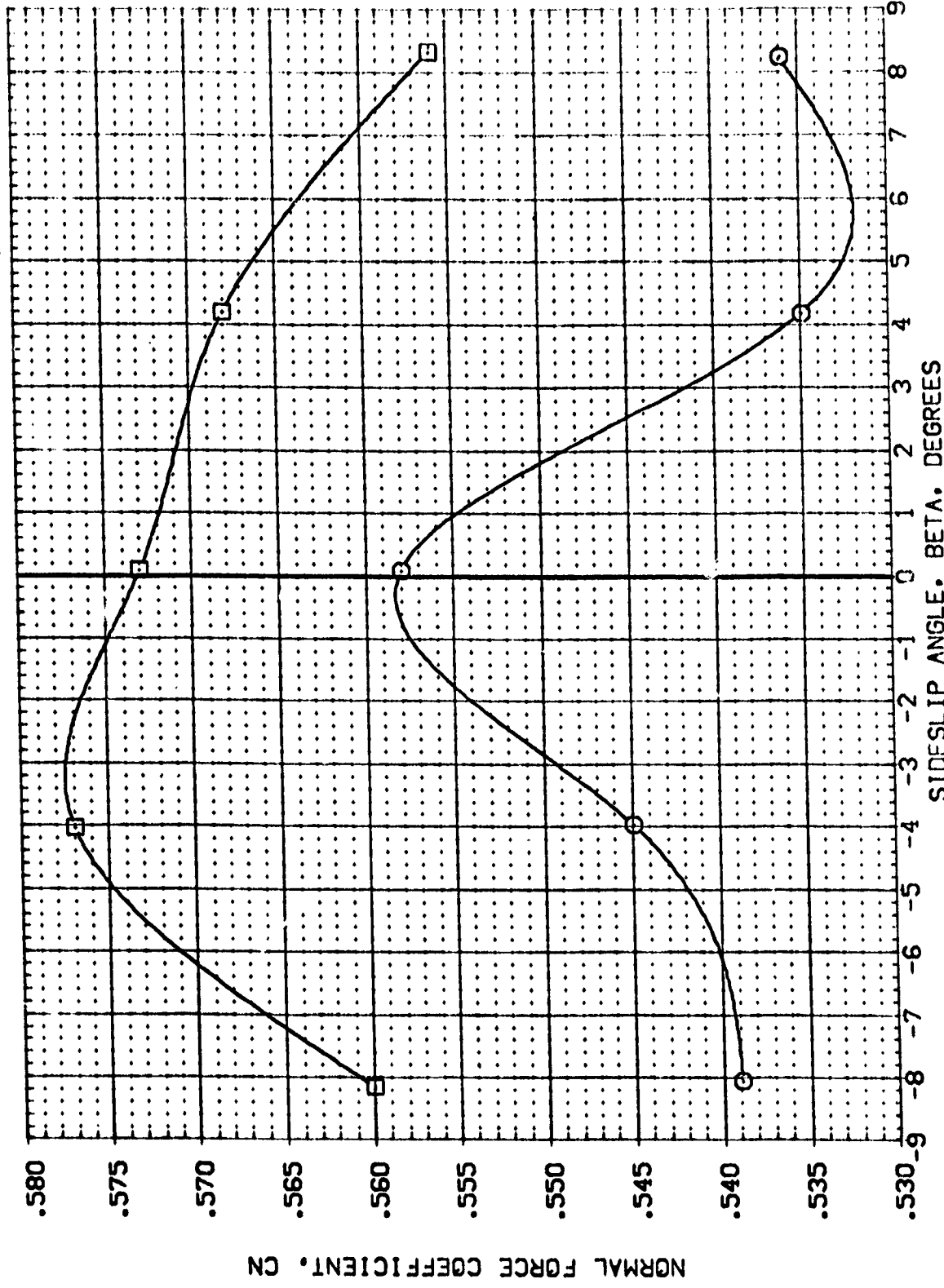


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., YN=0.599, Z.900

AVES 11-707 0A12 02A

(R9P009)

SYMBOL MACH .599 ALPHA 10.000 ELEVEN .000
 RUDDER -10.000 RUDDLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8450
 BREF 38.8450
 XMRP 32.2000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

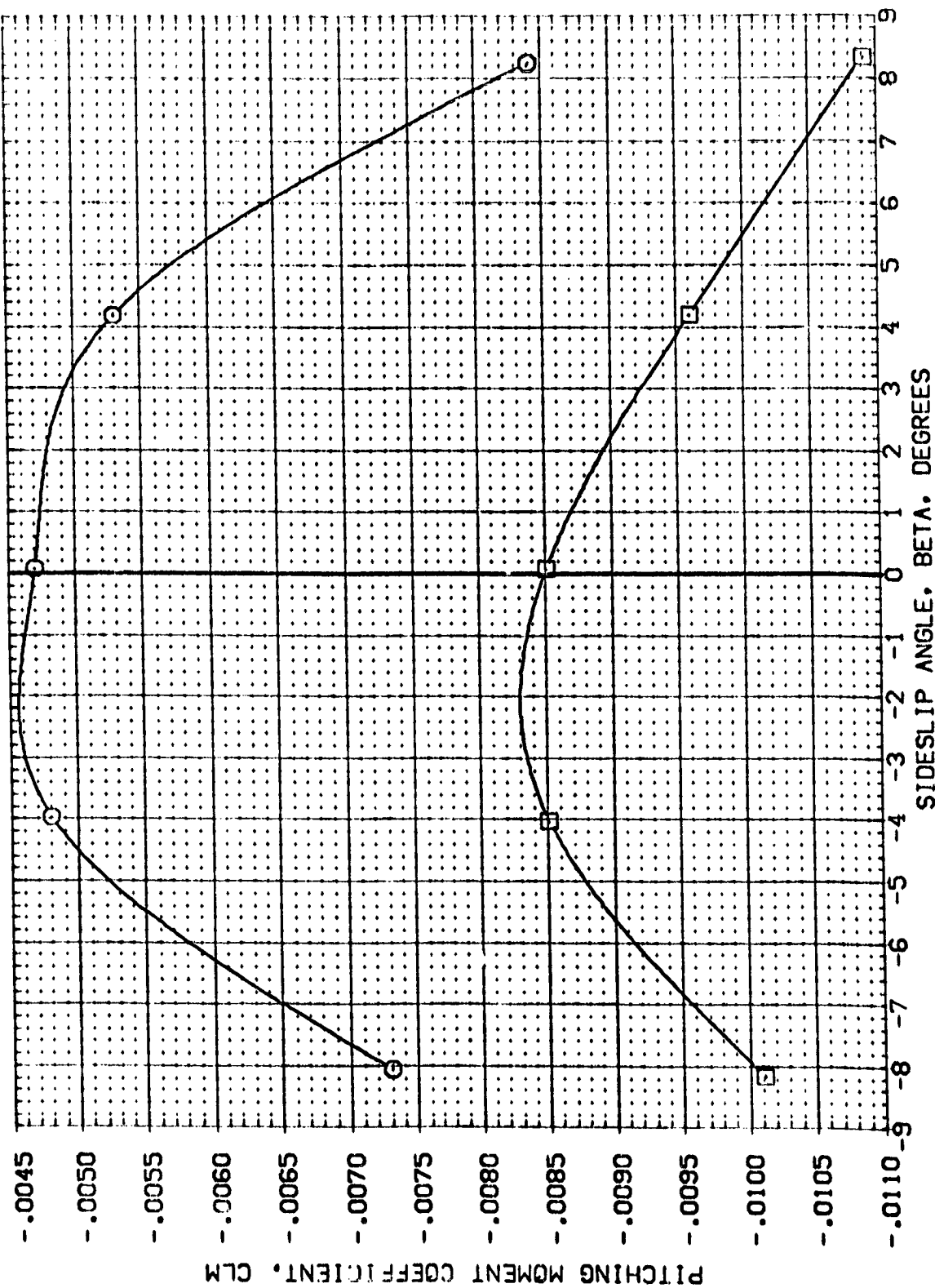


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MN=0.599, 0.900



AMES 11-707 0A12 02A

(RBP009)

SYMBOL
□

MACH
.599
.900

PARAMETRIC VALUES
ALPHA 10.000 ELEVON .000
RUDDER -10.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.8490
BREF 38.8490
XREF 32.3000
YREF 10.0000
ZREF 10.0000
SCALE 1.0000

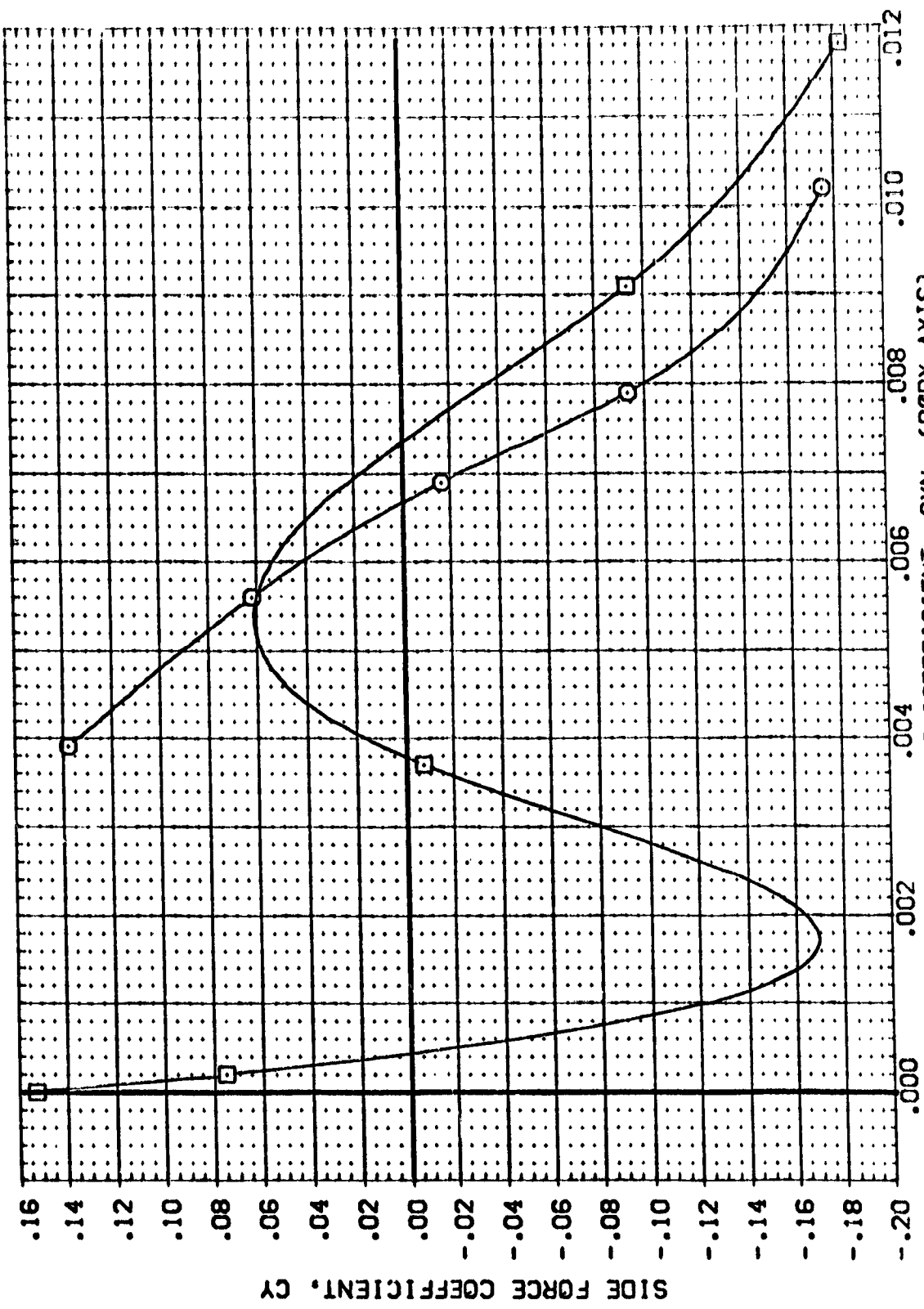


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., MACH=0.599,0.900

(ABPOOS)

AVES 11-707 0A12 02A

SYMBOL MACH .599 ALPHA 10.000 ELEVON .000
RUDDER -10.000 RUDFLR .000

REFERENCE INFORMATION
SHEET 2 OF 10
PAGE 80

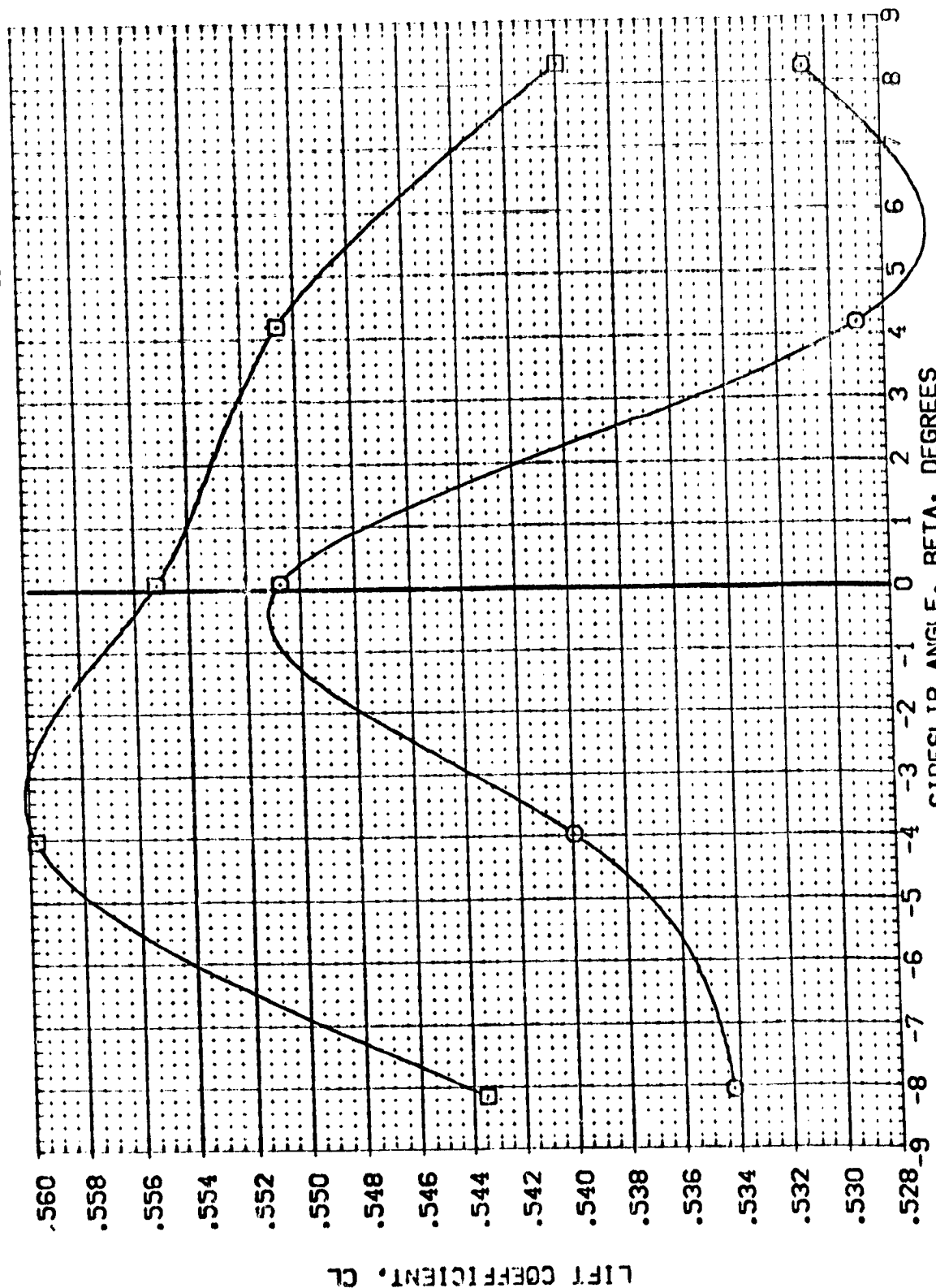


FIG.12 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-10 DEGS., $M_N=0.599, 0.900$



AMES 11-707 0A12 02A
 MACH .601
 .902
 SYMBOL ☐

PARAMETRIC VALUES
 ALPHA 15.000
 RUDDER -10.000
 ELEVON .000
 RUDDLR .000

(RBP010)

REFERENCE INFORMATION
 SREF 2.4210
 LREF 29.8450
 BREF 38.8450
 XREF 32.3000
 YREF 11.7777
 ZREF 11.7777
 SCALE 1.0000

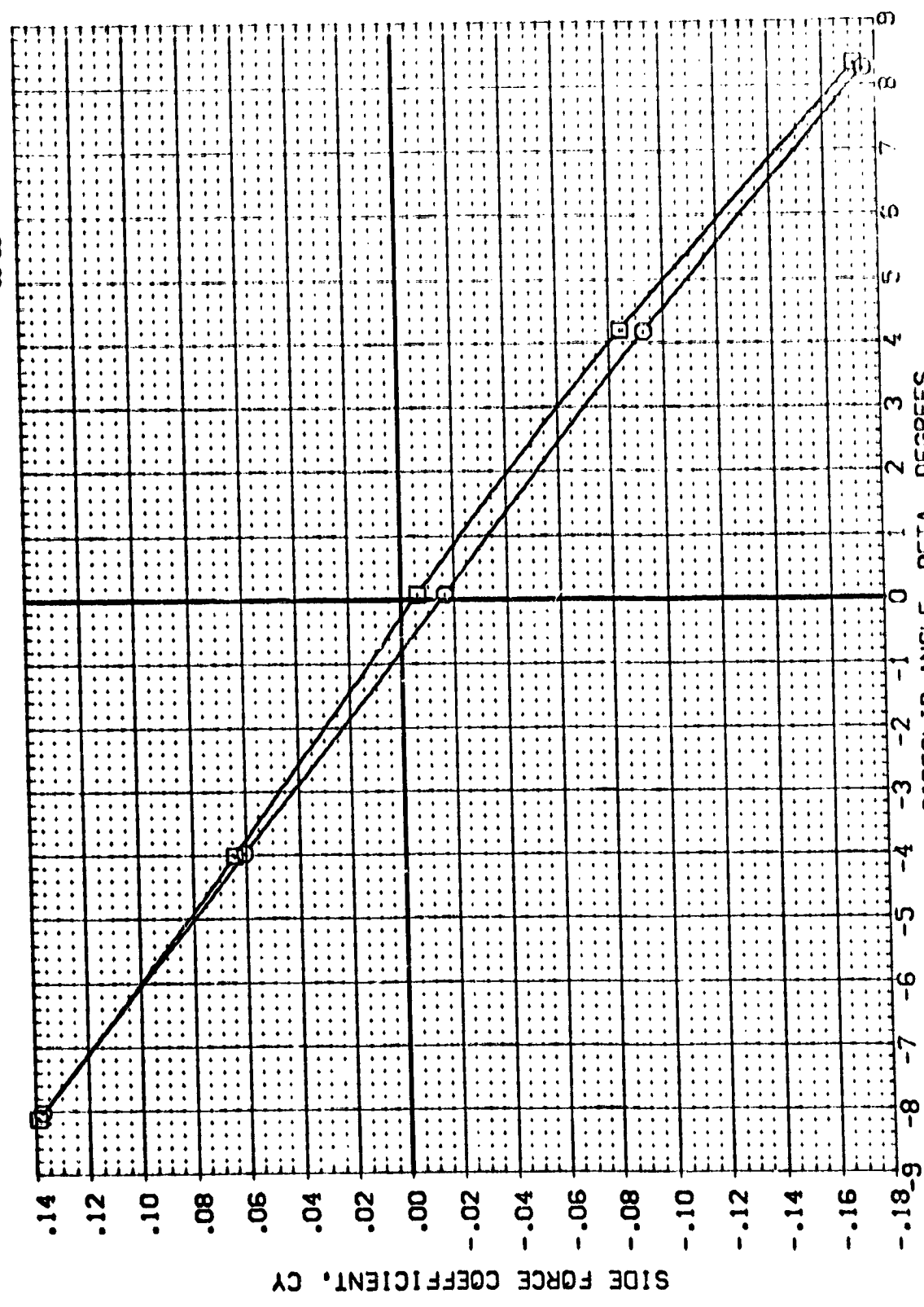


FIG.13 ORBITER LAT-Dir. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., $M_A=0.601$, $M=0.902$
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 8

AMES 11-707 0A12 02A

PARAMETRIC VALUES	SMOGL	MACH
ALPHA	.50:	
ELEV	15.000	
RDOFLR	-10.000	
	0-7	

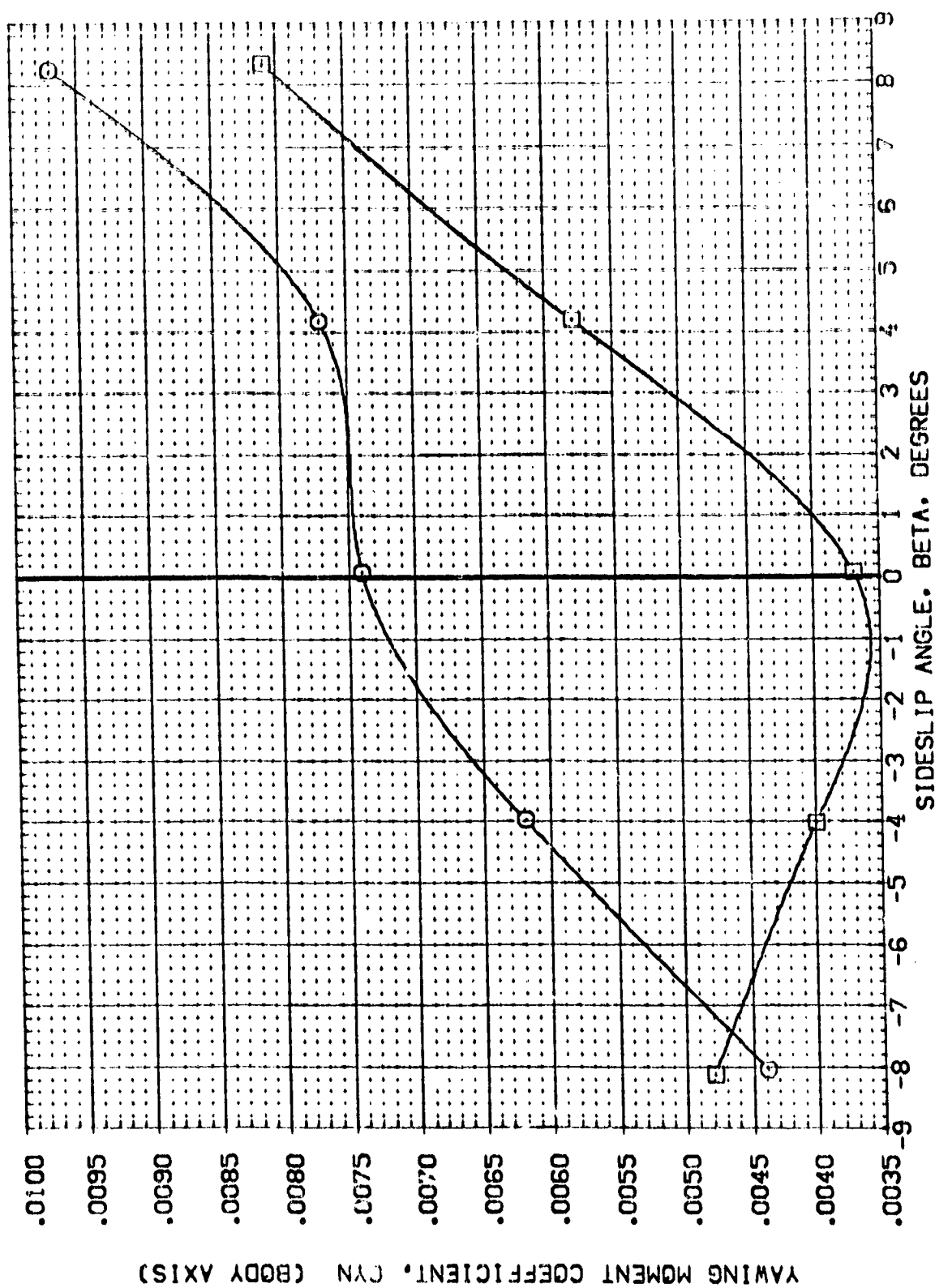
[illegible]

FIG. 13 ORBITER LAT-DIP. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., $\psi_1=0.601$, 0.902

AMES 11-707 CA12 G2A

SYMBOL	MACH	PARAMETRIC VALUES	
○	.501	ALPHA	ELEVON
□	.502	RODDER	ROFLER
			-10.000
			15.000
			.000
			.000

DATE	REFERENCE INFORMATION
2-4-58	2-4212
2-5-58	2-4213
2-6-58	2-4214
2-7-58	2-4215
2-8-58	2-4216
2-9-58	2-4217
2-10-58	2-4218
2-11-58	2-4219
2-12-58	2-4220
2-13-58	2-4221
2-14-58	2-4222
2-15-58	2-4223
2-16-58	2-4224
2-17-58	2-4225
2-18-58	2-4226
2-19-58	2-4227
2-20-58	2-4228
2-21-58	2-4229
2-22-58	2-4230
2-23-58	2-4231
2-24-58	2-4232
2-25-58	2-4233
2-26-58	2-4234
2-27-58	2-4235
2-28-58	2-4236
2-29-58	2-4237
2-30-58	2-4238
2-31-58	2-4239
2-32-58	2-4240
2-33-58	2-4241
2-34-58	2-4242
2-35-58	2-4243
2-36-58	2-4244
2-37-58	2-4245
2-38-58	2-4246
2-39-58	2-4247
2-40-58	2-4248
2-41-58	2-4249
2-42-58	2-4250
2-43-58	2-4251
2-44-58	2-4252
2-45-58	2-4253
2-46-58	2-4254
2-47-58	2-4255
2-48-58	2-4256
2-49-58	2-4257
2-50-58	2-4258
2-51-58	2-4259
2-52-58	2-4260
2-53-58	2-4261
2-54-58	2-4262
2-55-58	2-4263
2-56-58	2-4264
2-57-58	2-4265
2-58-58	2-4266
2-59-58	2-4267
2-60-58	2-4268
2-61-58	2-4269
2-62-58	2-4270
2-63-58	2-4271
2-64-58	2-4272
2-65-58	2-4273
2-66-58	2-4274
2-67-58	2-4275
2-68-58	2-4276
2-69-58	2-4277
2-70-58	2-4278
2-71-58	2-4279
2-72-58	2-4280
2-73-58	2-4281
2-74-58	2-4282
2-75-58	2-4283
2-76-58	2-4284
2-77-58	2-4285
2-78-58	2-4286
2-79-58	2-4287
2-80-58	2-4288
2-81-58	2-4289
2-82-58	2-4290
2-83-58	2-4291
2-84-58	2-4292
2-85-58	2-4293
2-86-58	2-4294
2-87-58	2-4295
2-88-58	2-4296
2-89-58	2-4297
2-90-58	2-4298
2-91-58	2-4299
2-92-58	2-4300
2-93-58	2-4301
2-94-58	2-4302
2-95-58	2-4303
2-96-58	2-4304
2-97-58	2-4305
2-98-58	2-4306
2-99-58	2-4307
2-100-58	2-4308
2-101-58	2-4309
2-102-58	2-4310
2-103-58	2-4311
2-104-58	2-4312
2-105-58	2-4313
2-106-58	2-4314
2-107-58	2-4315
2-108-58	2-4316
2-109-58	2-4317
2-110-58	2-4318
2-111-58	2-4319
2-112-58	2-4320
2-113-58	2-4321
2-114-58	2-4322
2-115-58	2-4323
2-116-58	2-4324
2-117-58	2-4325
2-118-58	2-4326
2-119-58	2-4327
2-120-58	2-4328
2-121-58	2-4329
2-122-58	2-4330
2-123-58	2-4331
2-124-58	2-4332
2-125-58	2-4333
2-126-58	2-4334
2-127-58	2-4335
2-128-58	2-4336
2-129-58	2-4337

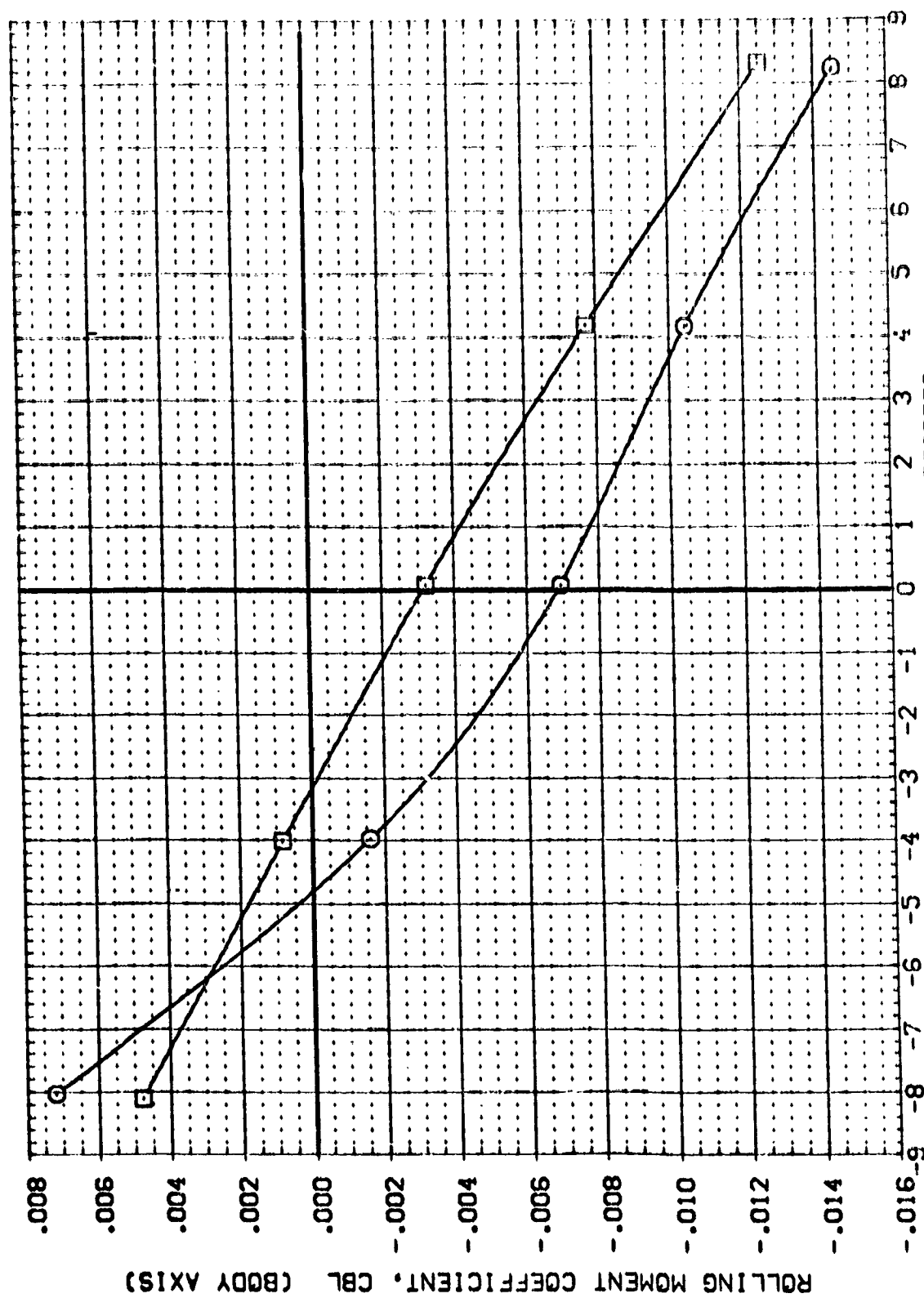


FIG. 13 CONTINUED. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., $\eta_N=0.501$, 0.902

(RBPC10)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
[] .501 .902
PARAMETRIC VALUES
15.000 ELEVON
-10.000 RUDDLR
.000
.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300
SQ.FT. 222222

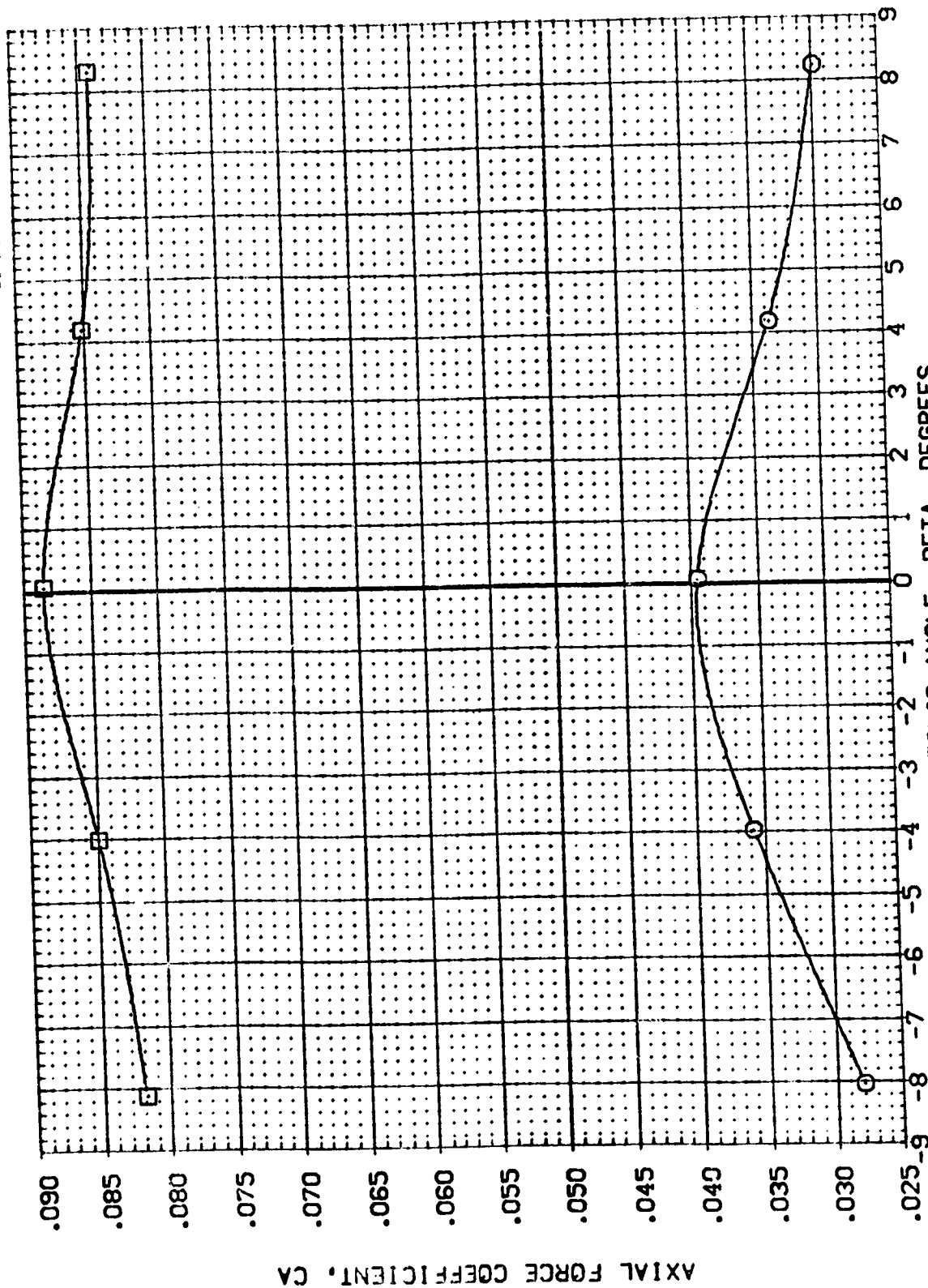


FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601, 0.902

AMES 11-707 0A12 02A

(RBP010)

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
		ALPHA	ELEVON	RUDDER	SREF	LREF	SC.FT.
○	.601	.902	15.000	.000	39.8450	39.8450	N.
□	.902	.000	-10.000	.000	32.3000	32.3000	N.
					XWRP	.0000	N.
					YWRP	.0000	N.
					ZWRP	.0000	N.
					SCALE	.0300	SCALE

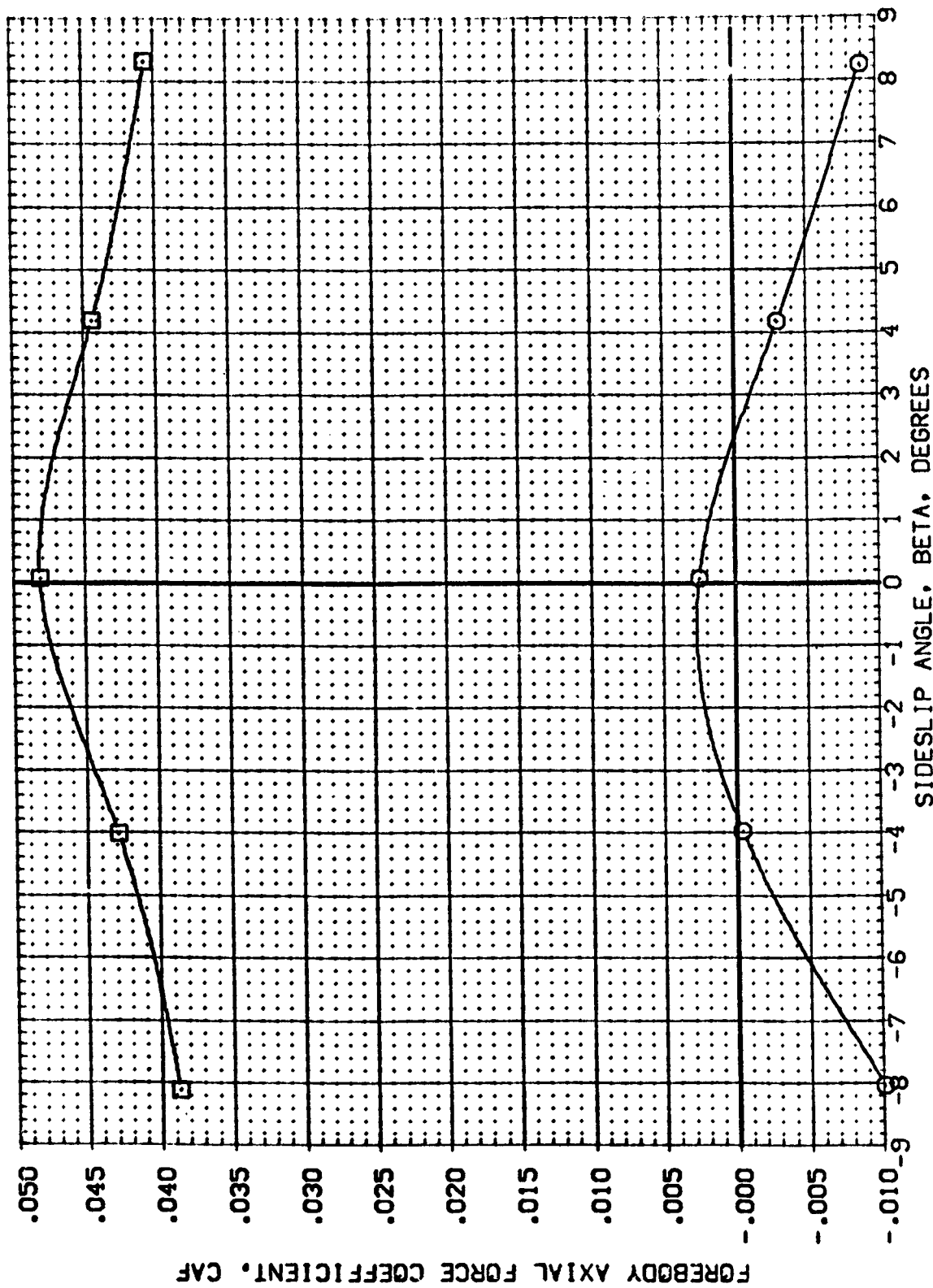


FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601,0.902

(RBP010)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR
[] .601 .902 15.000 -10.000 .000 .000

REFERENCE INFORMATION
SREF 2.4210 SC.F.T.
LREF 38.8450
BREF 38.8450
XMRP 32.0000
YMRP .0000
ZMRP .0000
SCALE .0300

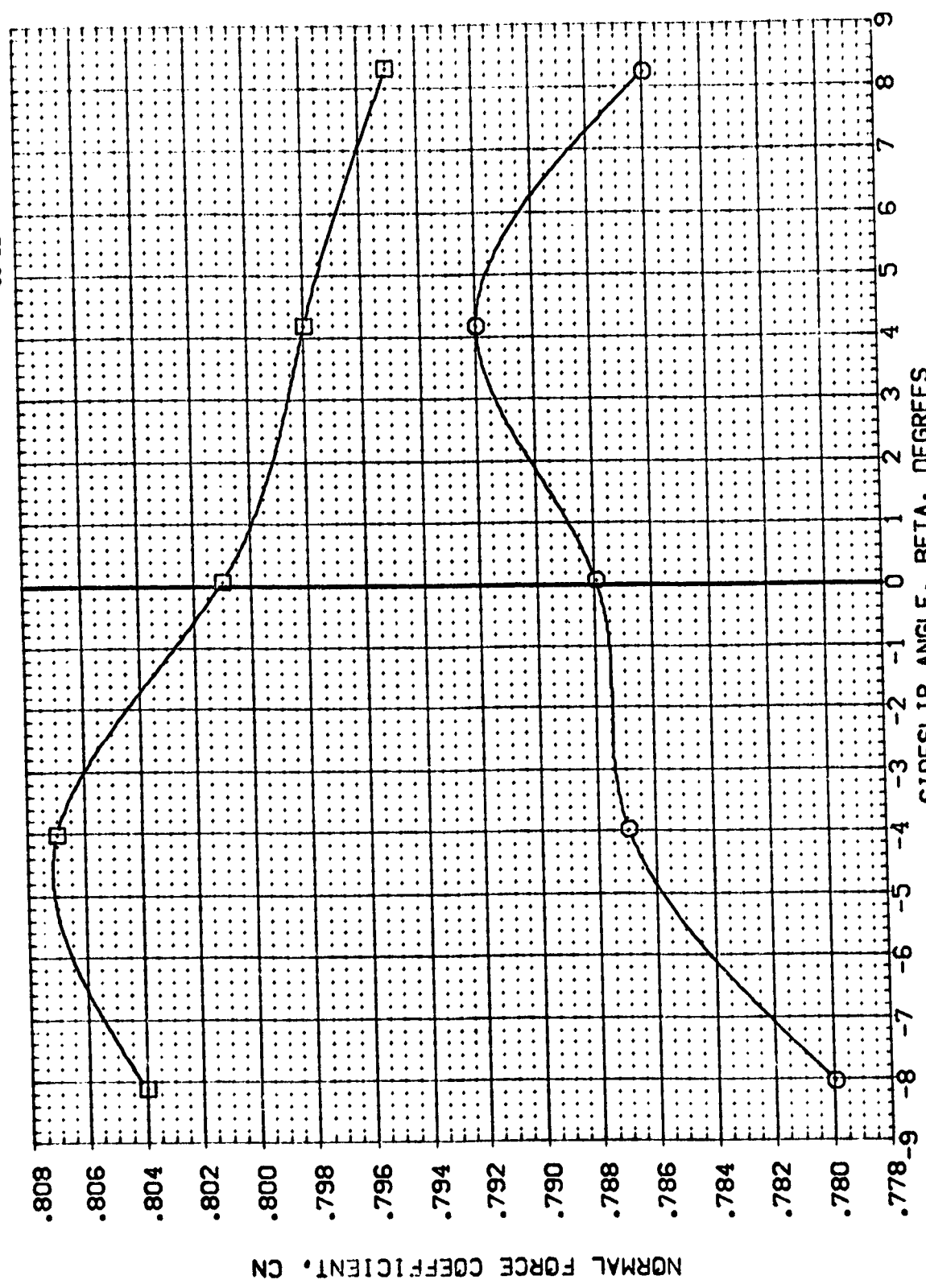


FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601, 0.902
PAGE 86

(RBPO10)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
○	.601	ALPHA	15.000
□	.902	RUDDER	-10.000
		ELEVON	.000
		RUOFLR	.000

REFERENCE INFORMATION

SREF	2.4210	SO.FT.
LREF	38.8490	IN.
BREF	38.8490	IN.
XGRP	32.0000	IN.
YGRP	.0000	IN.
ZGRP	.0000	IN.
SCALE	.0300	SCALE

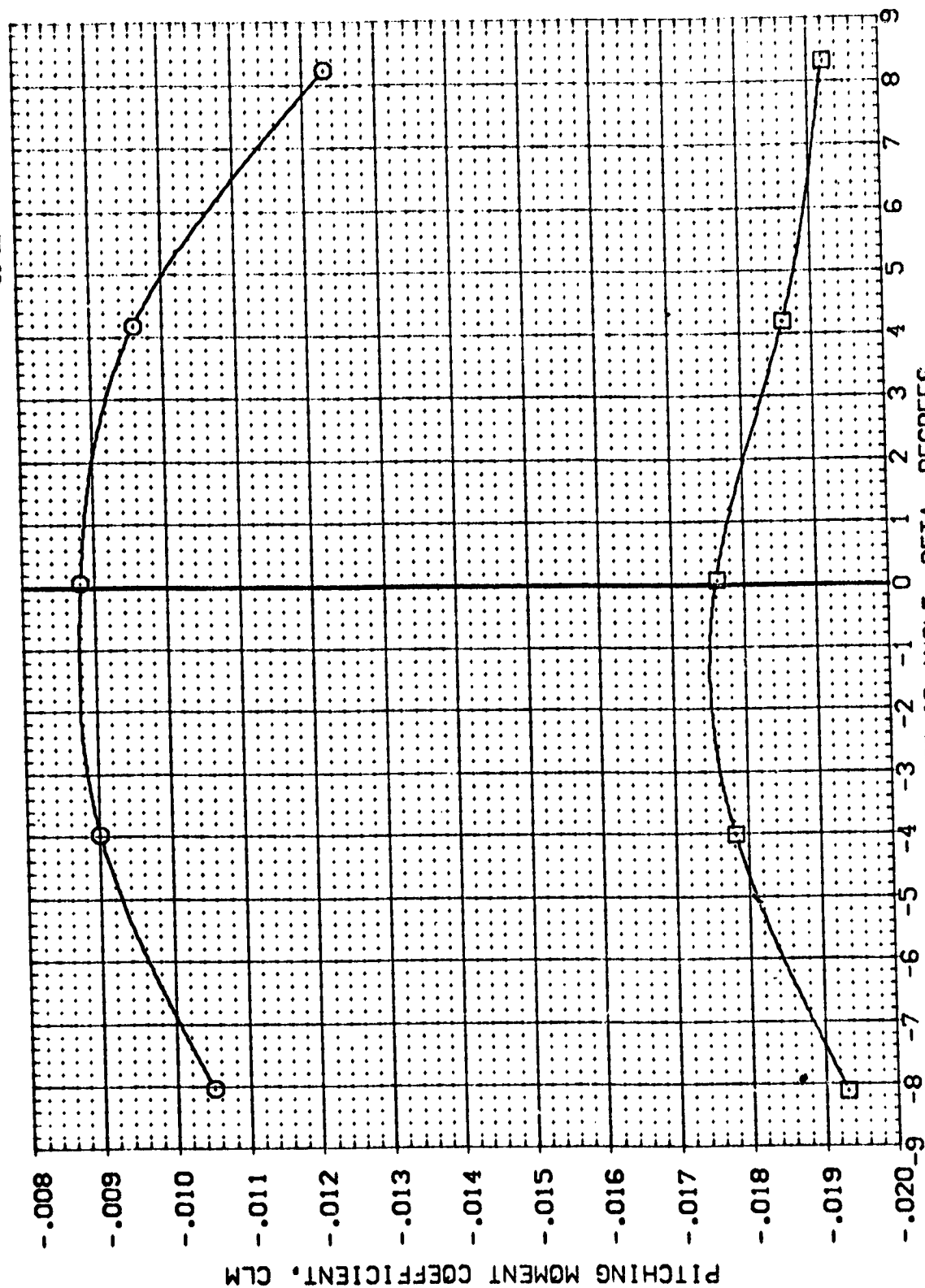


FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601,0.902



(RBPO10)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
○ .601 .000 ELEVON .000
□ .902 -10.000 RUDDER .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF 0.0000
ZREF 0.0000
SCALE .0300

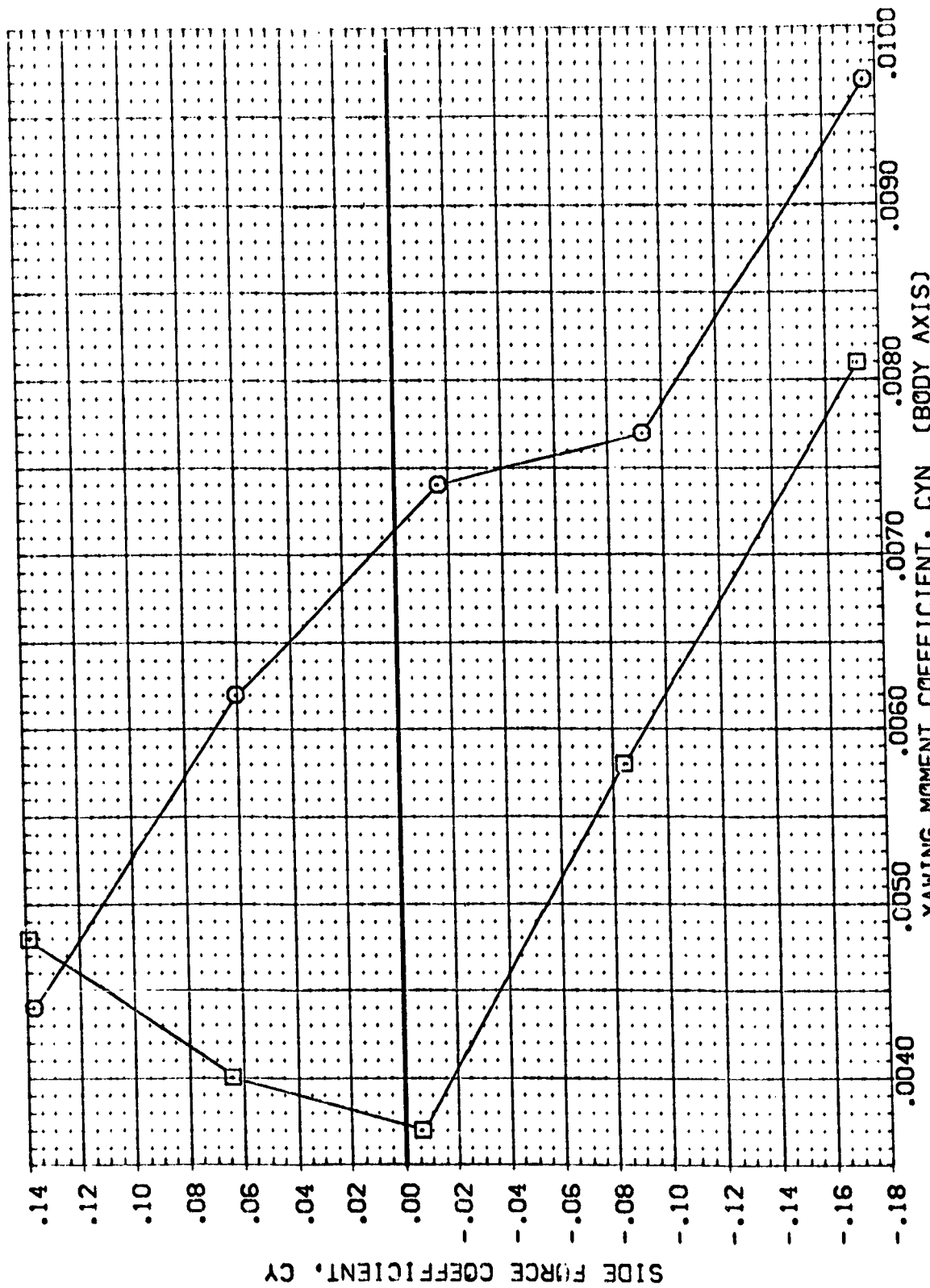


FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601,0.902

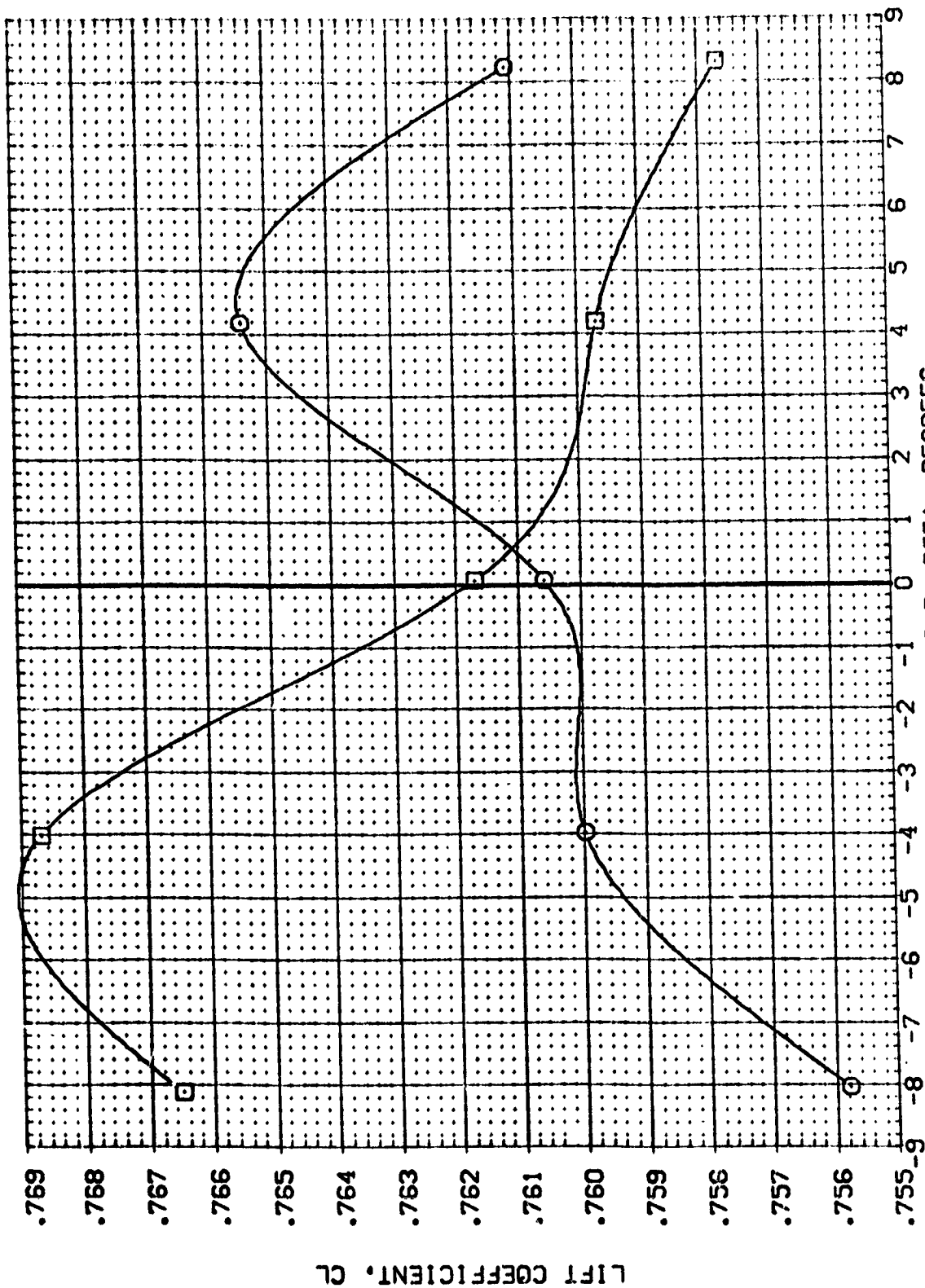


AMES 11-707 0A12 02A

(ABP010)

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	ELEVON	.000
□	.601	.902		15.000		
				-10.000	RUDDLR	.000

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8450
BREF	39.8450
XMRP	32.3000
YMRP	0.0000
ZMRP	0.0000
SCALE	0.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.13 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-10 DEGS., MN=0.601, 0.902

(RBP011)

AMES 11-707 0A12 02A

SYMBOL WACH .598
 ALPHA 20.000
 RUDDER -10.000
 ELEVON .000
 RUFLR .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 38.8430
 BREF 38.8430
 XMRP 32.2000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

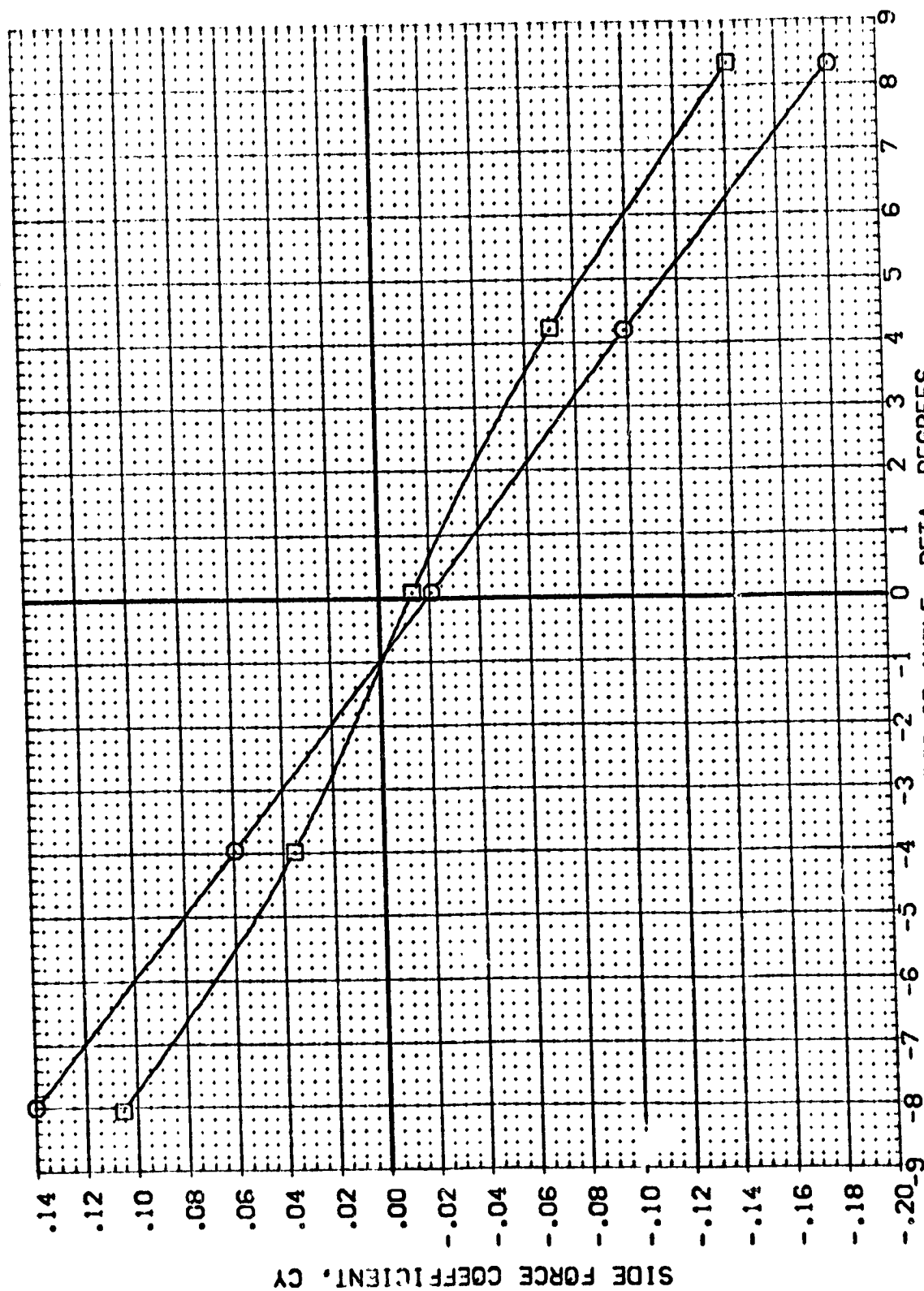


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., MN=0.598,0.901

AMES 11-707 0A12 02A

(RBP011)

SYMBOL MACH ALPHA RUDDER
 20.000 ELEVON .000
 -10.000 RUDDLR .000

REFERENCE INFORMATION
 SREF 2.42:0 SQ.FT.
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

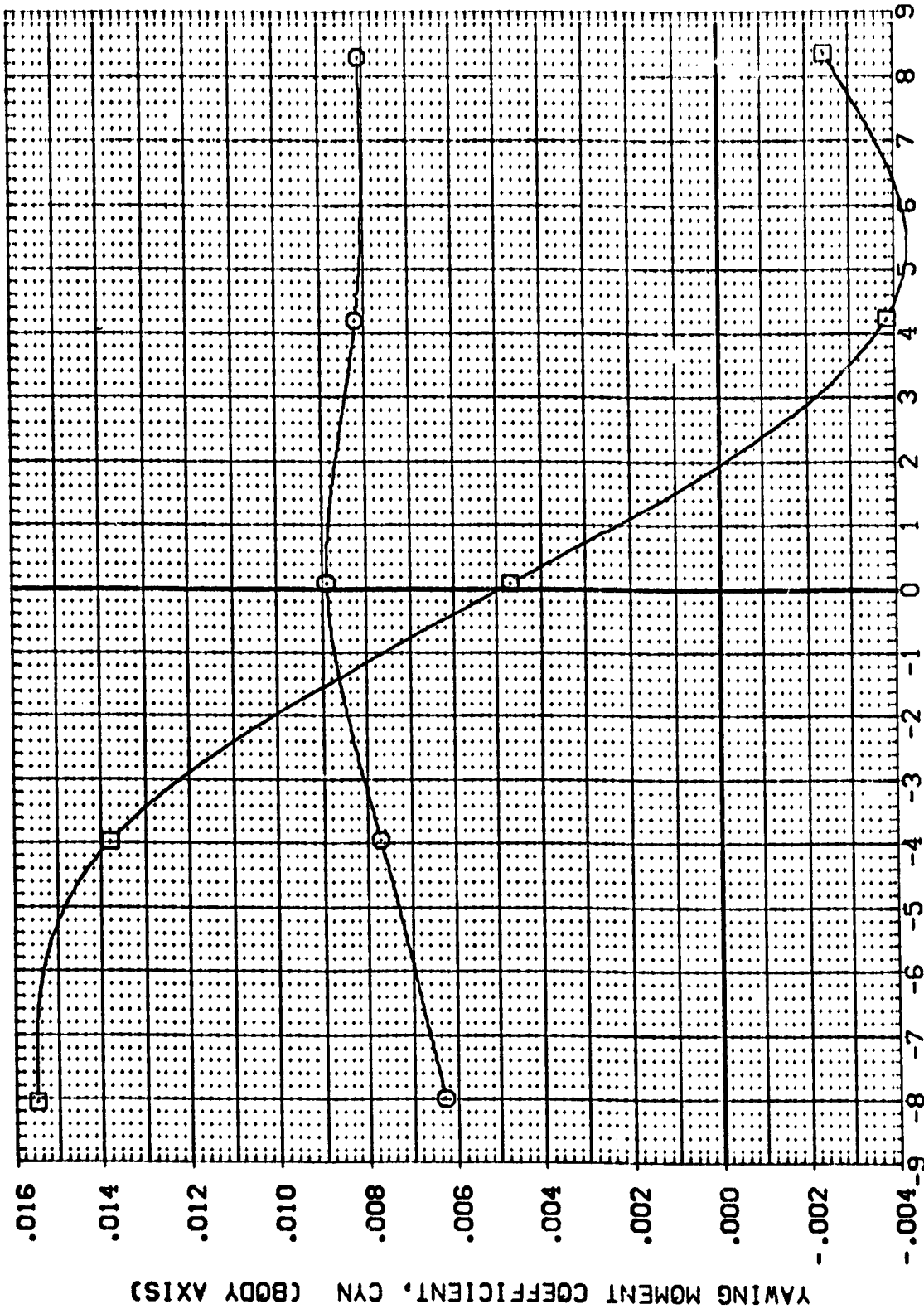


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., MN=0.598, 0.901



(RBP011)

AMES 11-707 OA12 02A

SYMBOL MACH ALPHA RUDDER
□ .598 20.000 ELEVON .000
○ .931 -10.000 RUDDLR .000

REFERENCE INFORMATION:
SREF 2.421C
LREF 39.8450
SREF 39.8450
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

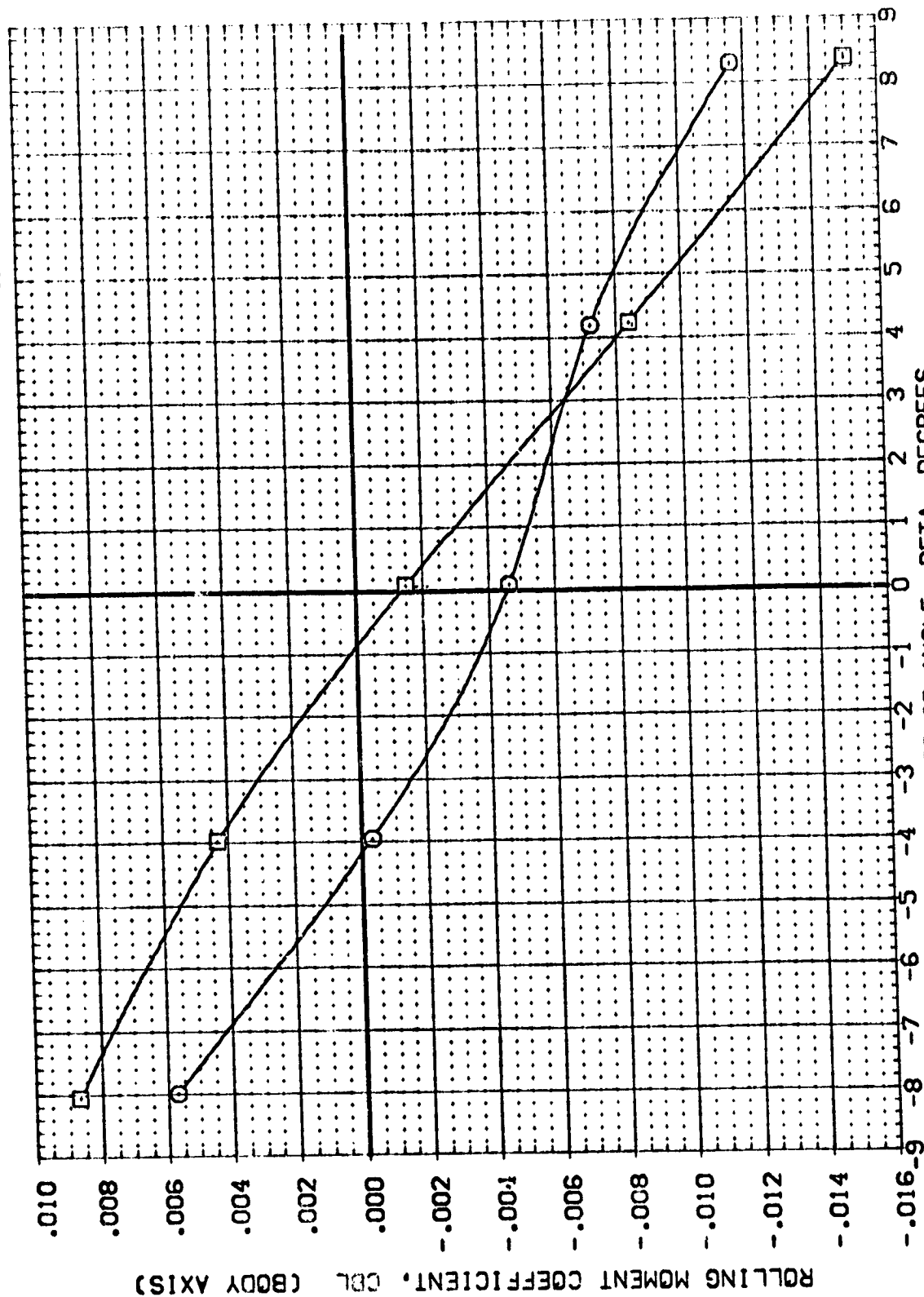


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., MN=0.598, 0.901
PAGE 92



AMES 11-707 0A12 02A

(RBP011)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDDER	SCALE
○	.598	20.000	20.000	.000	.000	
□	.901	-10.000	-10.000	.000	.000	

REFERENCE INFORMATION

SREF	2.4210	SG.FT.
LREF	20.8450	
BREF	20.8450	
XREF	32.3000	
YREF	.0000	
ZREF	.0000	
SCALE	.0000	

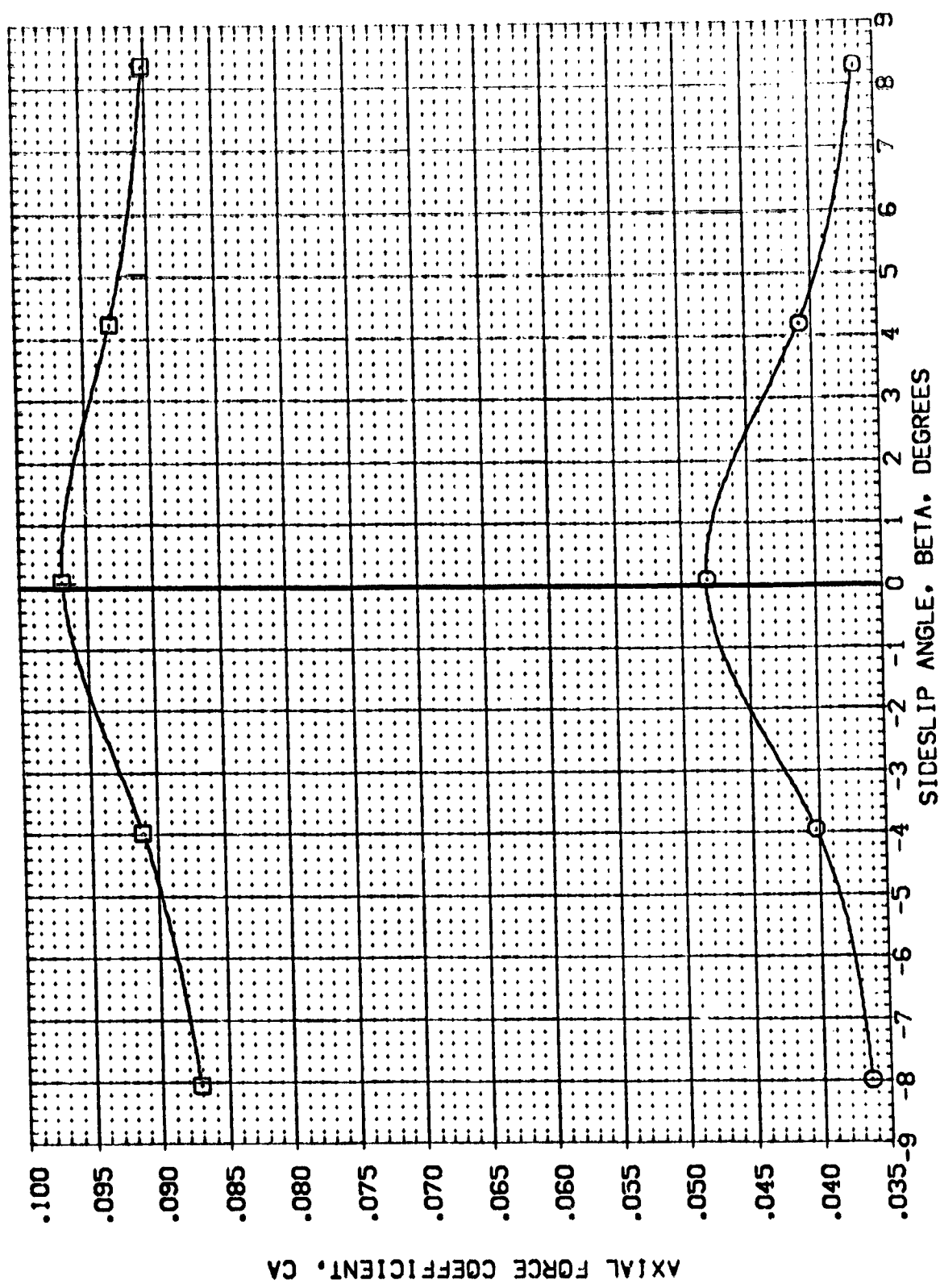


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., MN=0.598,0.901

AMES 11-707 0A12 02A

(R8P011)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 ○ .598 .901 20.000 ELEVON .000
 □ .901 -10.000 RUDFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8450
 BREF 38.8450
 XREF 32
 YREF 0.000
 ZREF 0.000
 SCALE 1.000

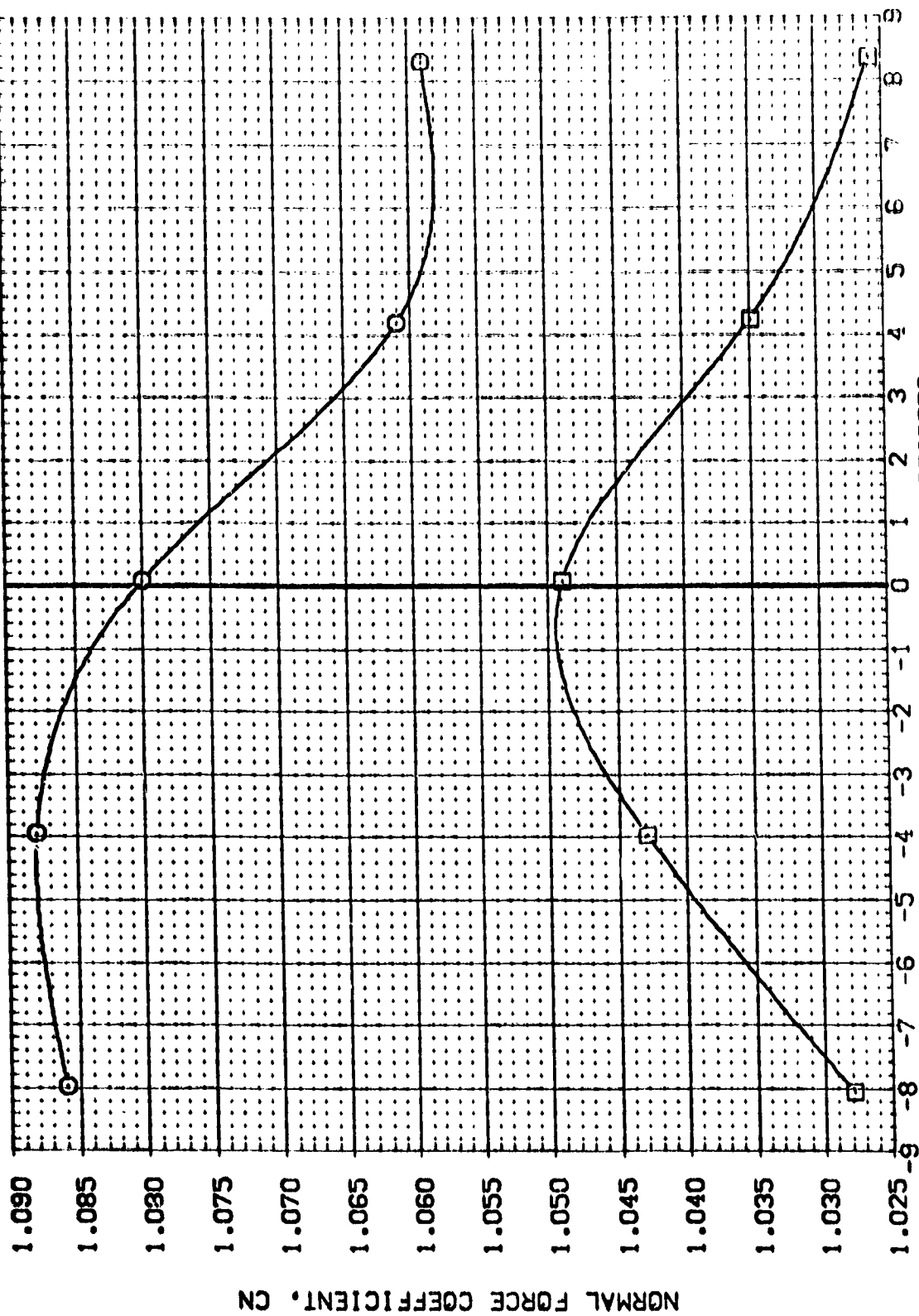


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., MN=0.598, 0.901

6
7
8
9
10
11
12
13

SYMBOL	WADCH	PARAMETRIC VALUES	
SY90L	.598	ALPHA	20.000
Q11	.901	PJDDER	-10.000
		ELEVEN	
		RJDDER	
			.000
			.000

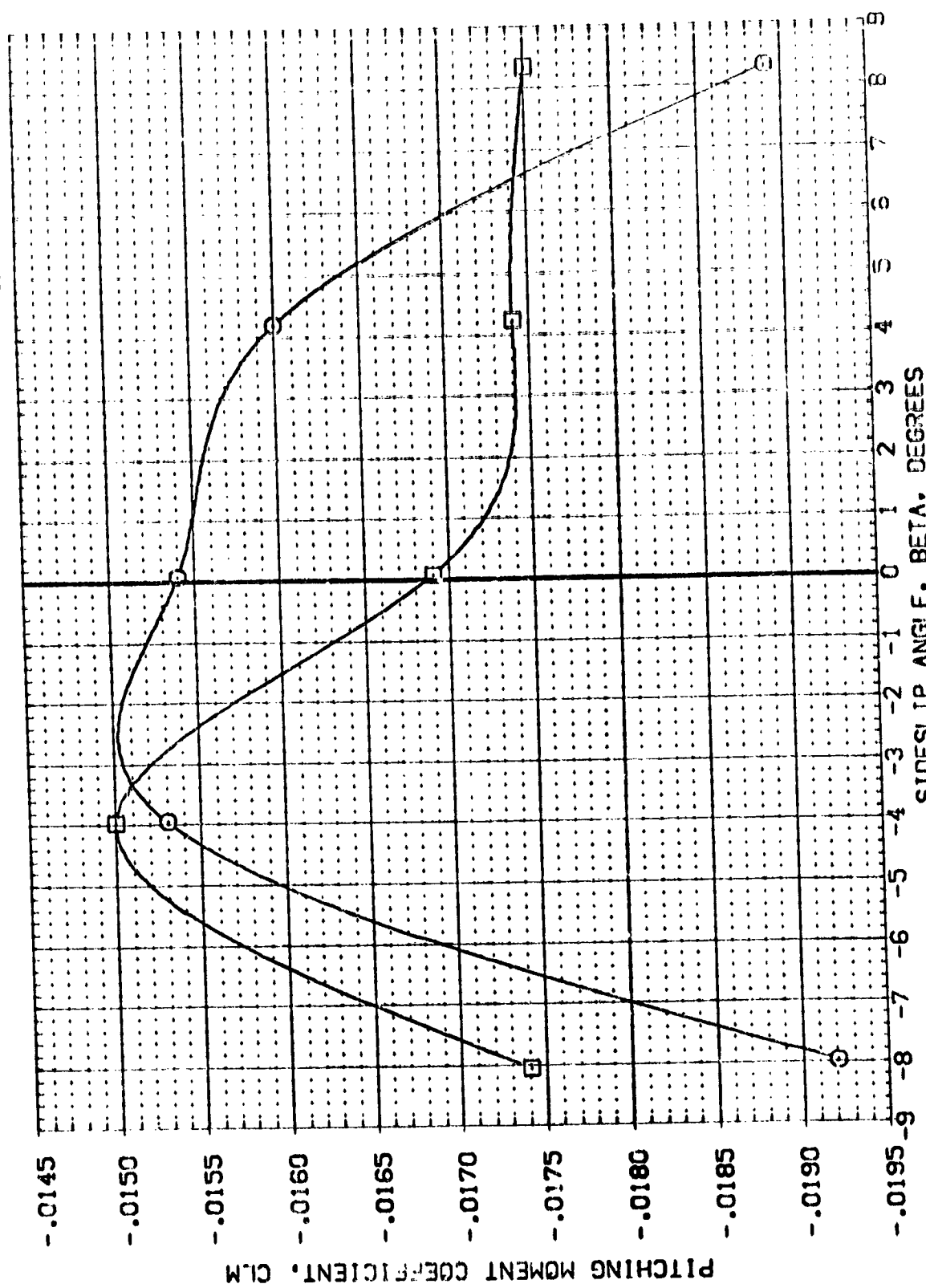
[illegible]

FIG. 14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., $\gamma_N=0.598, 0.901$

AMES 11-707 CA12 02A

SYMBOL	MACH	ALPHA	20,000	ELEVON	PARAMETRIC VALUES
0	.598	2000	-10,000	2000	.000
1	.671	2000	-10,000	2000	.000

REFERENCE INFORMATION

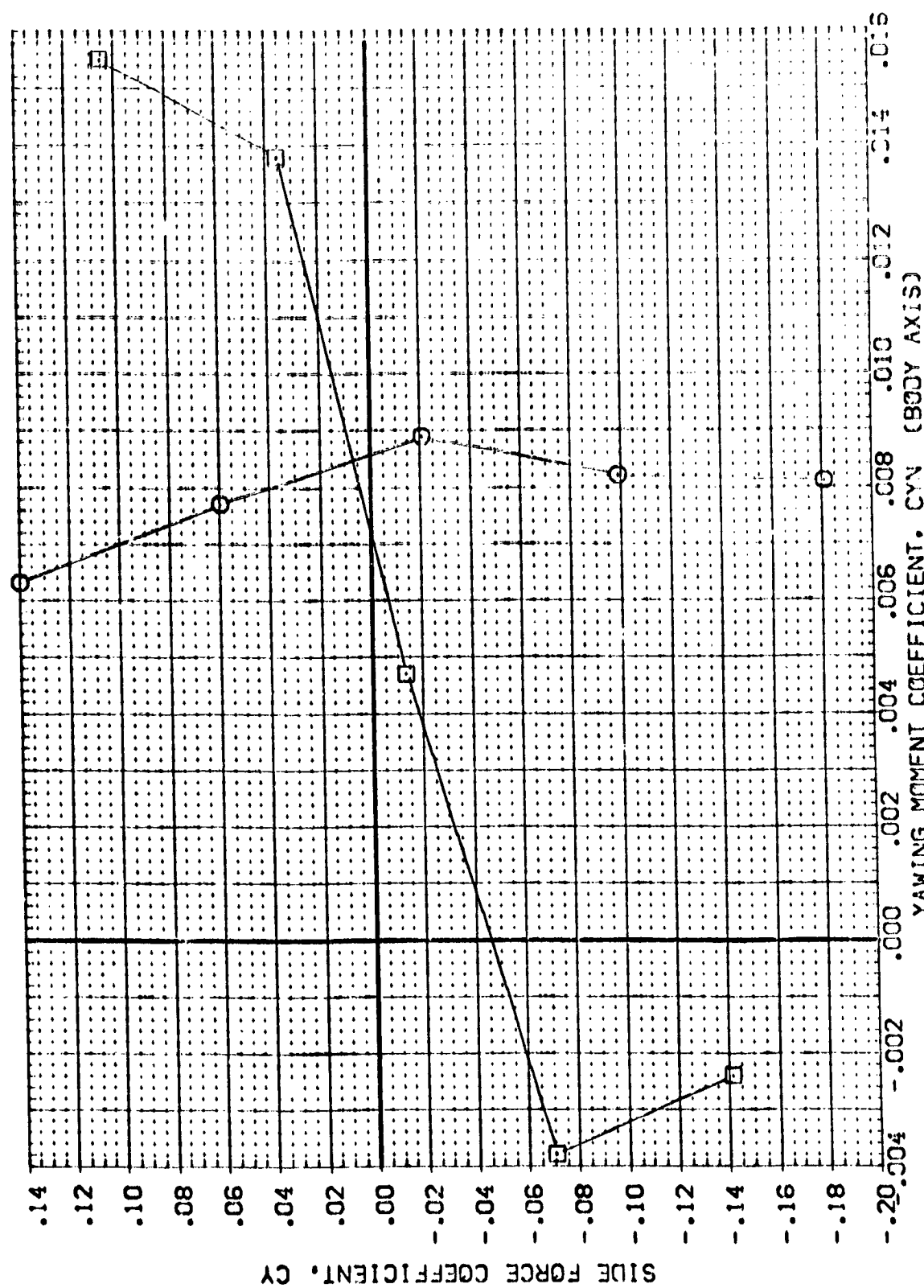


FIG. 14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-10 DEGS., "W0.593,0.90."

(ABP011)

AVES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		
		ALPHA	ELEVON	RUDDER
○	.598	20.000	.000	.000
□	.901	-10.000	.000	.000

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
BREF	39.8490
XREF	32.3000
YREF	.0000
ZREF	.0000
SCALE	.0300

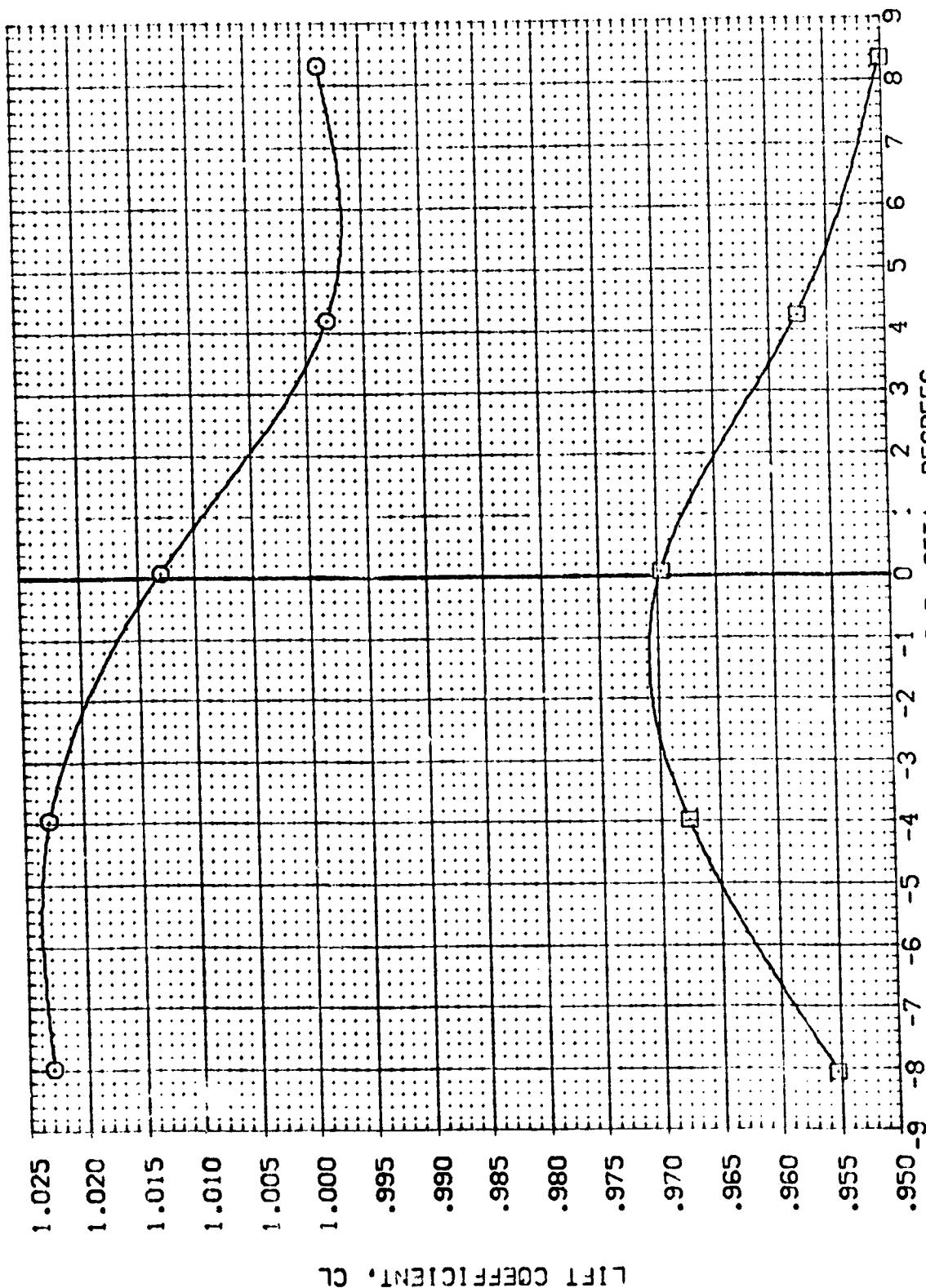


FIG.14 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS.. RUDDER=-10 DEGS.. MN=0.598,0.901

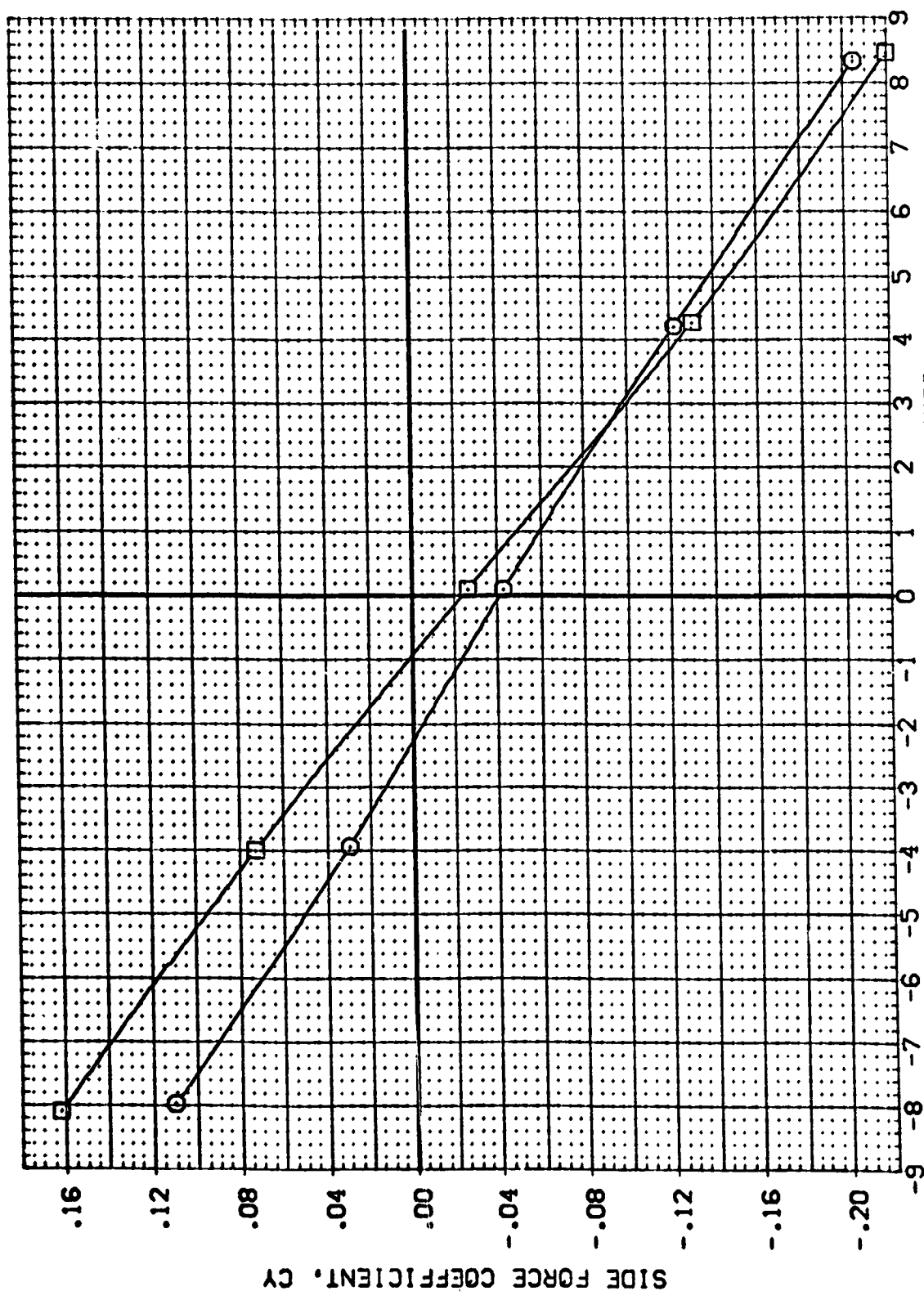


AMES 11-707 0A12 02A

(RBP012)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDLR .000 .000 .000 .000

REFERENCE INFORMATION SREF 2.4210 SQ.FT. LREF 39.8490 IN. BREF 39.8490 IN. YMRP 32.3000 IN. ZMRP .0000 IN. SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901

(RBP012)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .599 .000 ELEVON .000
○ .901 -20.000 RUOFLR

REFERENCE INFORMATION
SREF 2.421C SQ.FT.
LREF 39.849C
BREF 39.849C
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

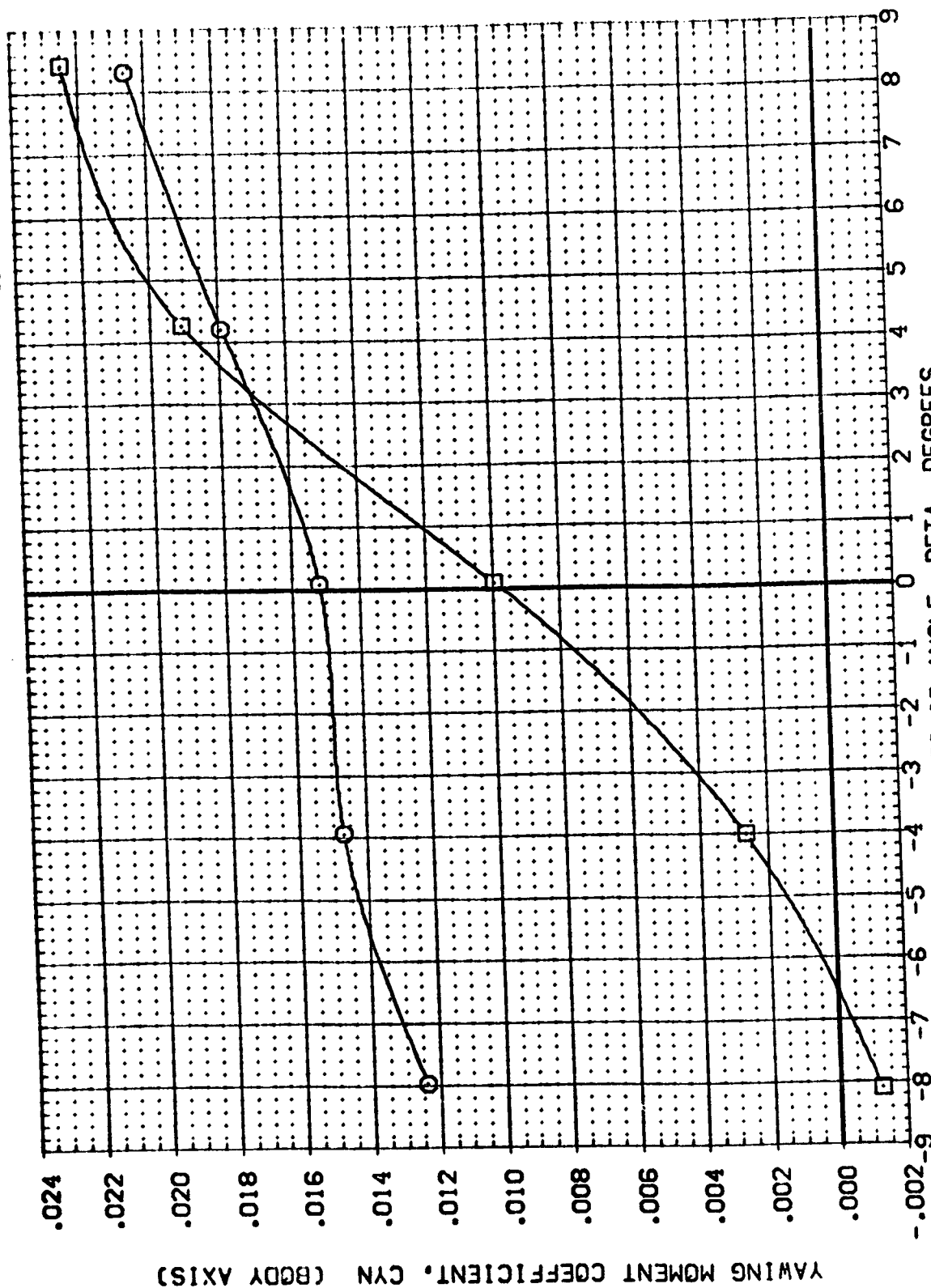


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901



AMES 11-707 0A12 02A

(RBP012)

SYMBOL	MACH	PARAMETRIC VALUES	
□	.599	ALPHA	.000
□	.901	RUDDER	-20.000
		ELEVON	.000
		RUOFLR	.000

REFERENCE INFORMATION	
SREF	2.421C
LREF	39.8450
BREF	39.8450
YREF	32.3
ZREF	.000
SCALE	.000

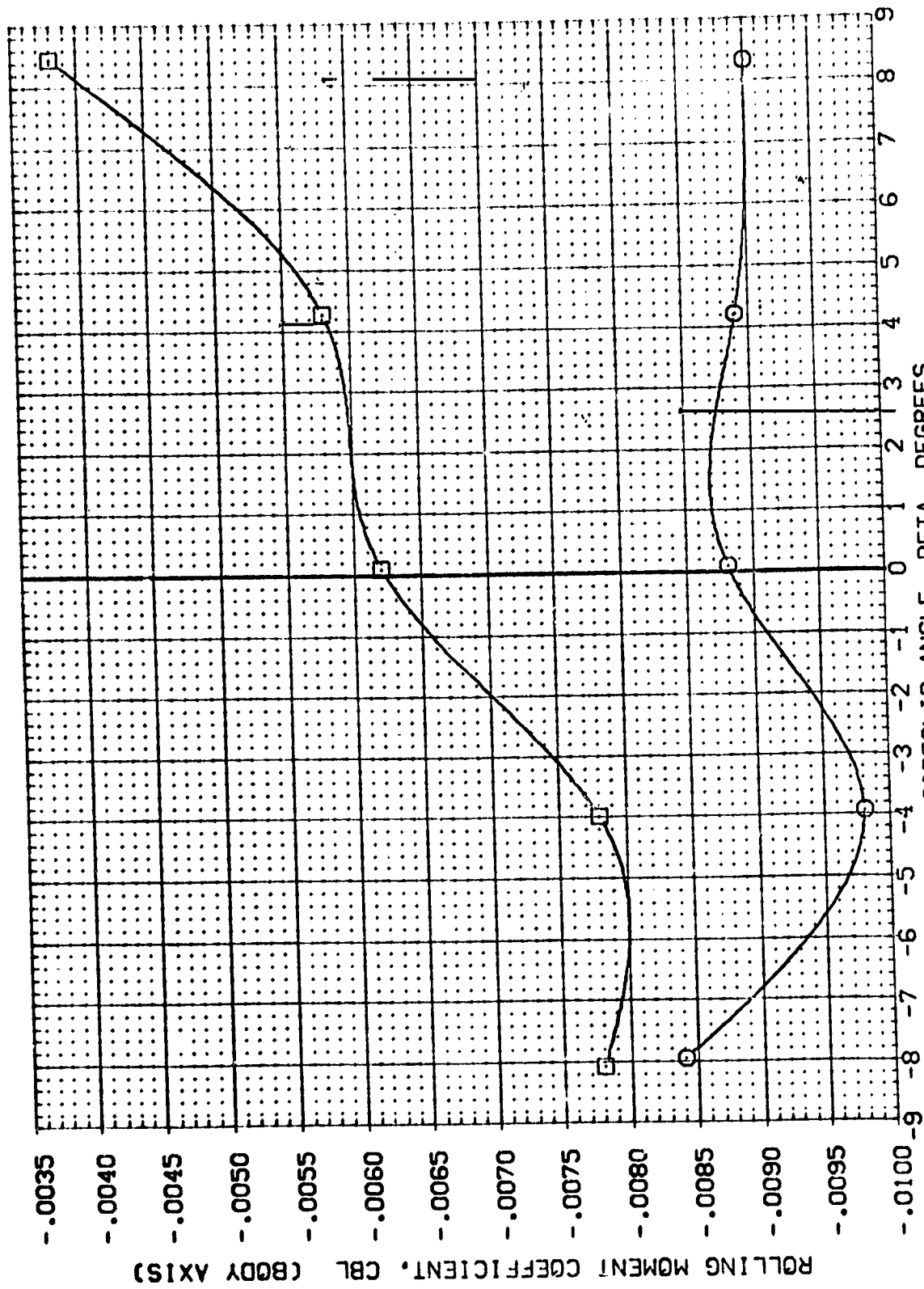


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599, 0.901

(RBPO12)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION						
		ALPHA	ELEVON	RUDDER	SREF	LREF	BREF	XMRP	YMRP	ZMRP	SCALE
□	.599	.000	.000	.000	2.4210	39.8450	39.8450	32.3000	.0000	.0000	.0300
○	.901	-20.000	.000	.000							

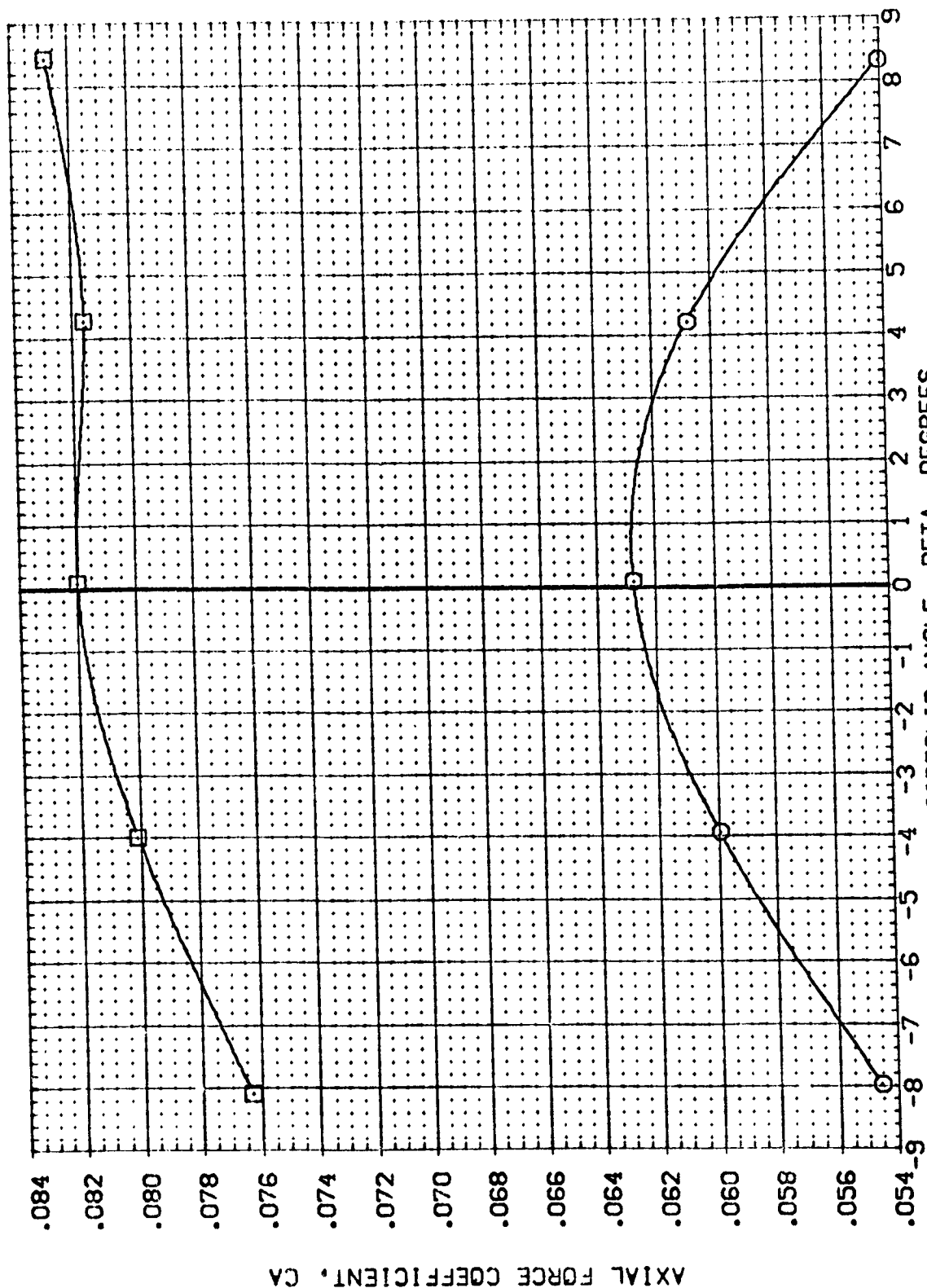


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901

(RBP012)

AMES 11-707 CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .599 .000 ELEVON .000
□ .901 -20.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XGRP 32.3000
YGRP 0.0000
ZGRP 0.0000
SCALE 1.0000

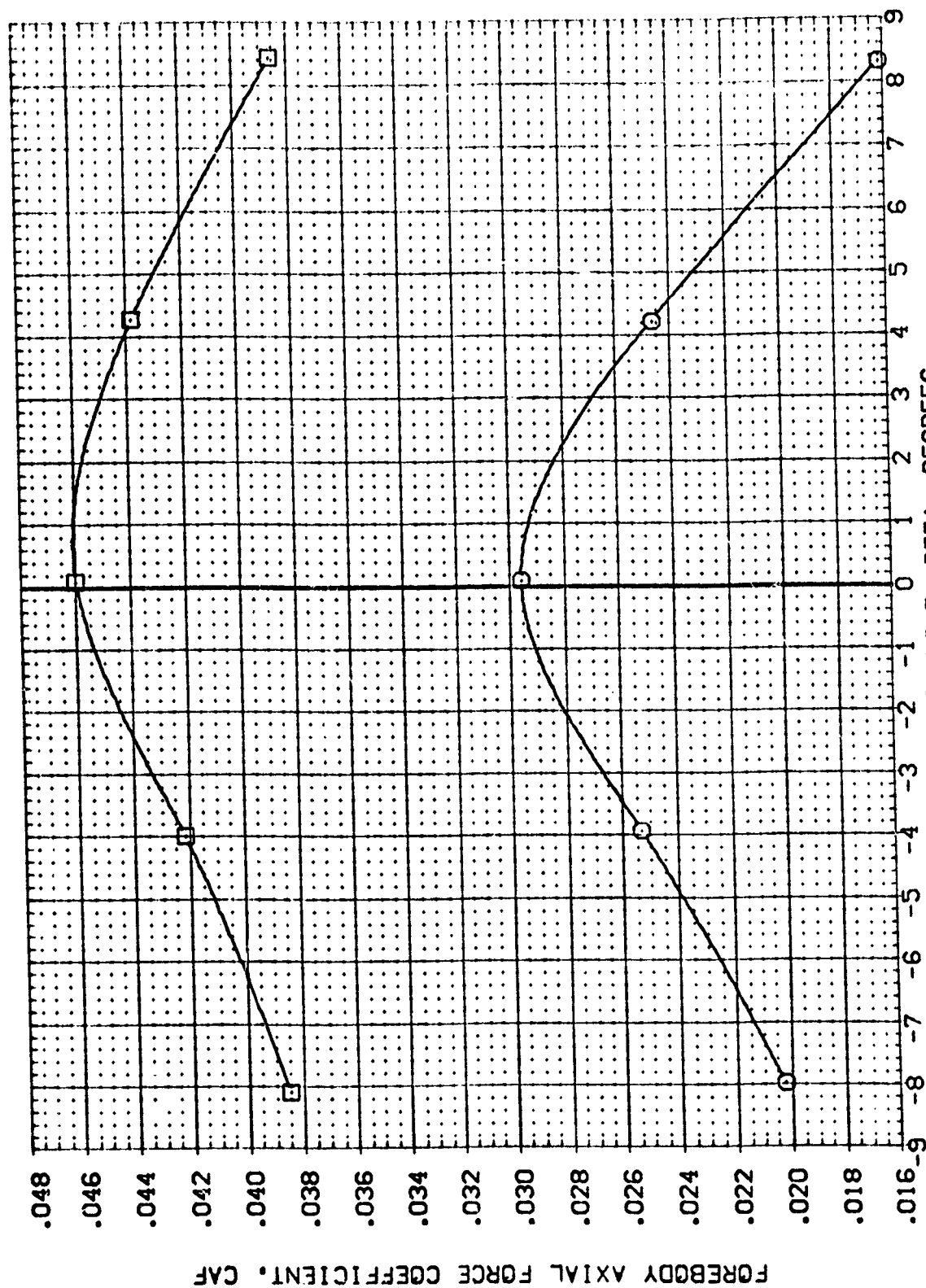


FIG.15 ORBITER LAT-OIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901
SIDESLIP ANGLE, BETA, DEGREES
PAGE 103

(RBP012)

AMES 11-707 0A12 02A

SYMBOL
○ □

MACH
.599
.901

PARAMETRIC VALUES
ALPHA
RUDDER

ELEVON
RUEFLR

.000
-20.000
.000

REFERENCE INFORMATION:
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300

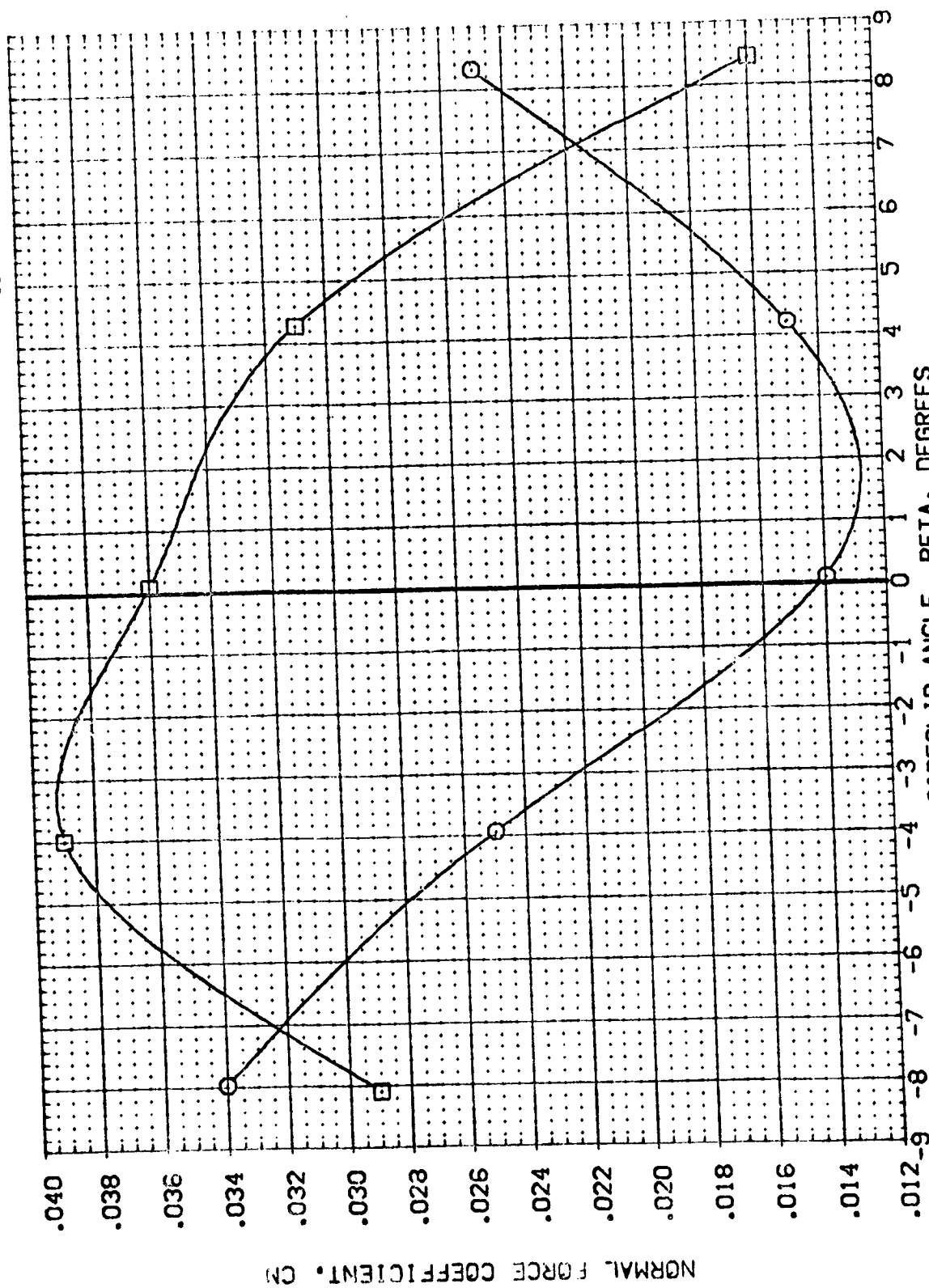


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901

AMES 11-707 0A12 02A

(RBP012)

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	ELEVON	RUOFLR	
□	.599	.000	-20.000		.000	.000	
□	.501	.000			.000		

REFERENCE INFORMATION

SREF	2.4210	SC.FT.
LREF	38.8490	
BREF	38.8490	
XPRP	32.3000	
YPRP	.0000	
ZPRP	.0000	
SCALE	.0300	

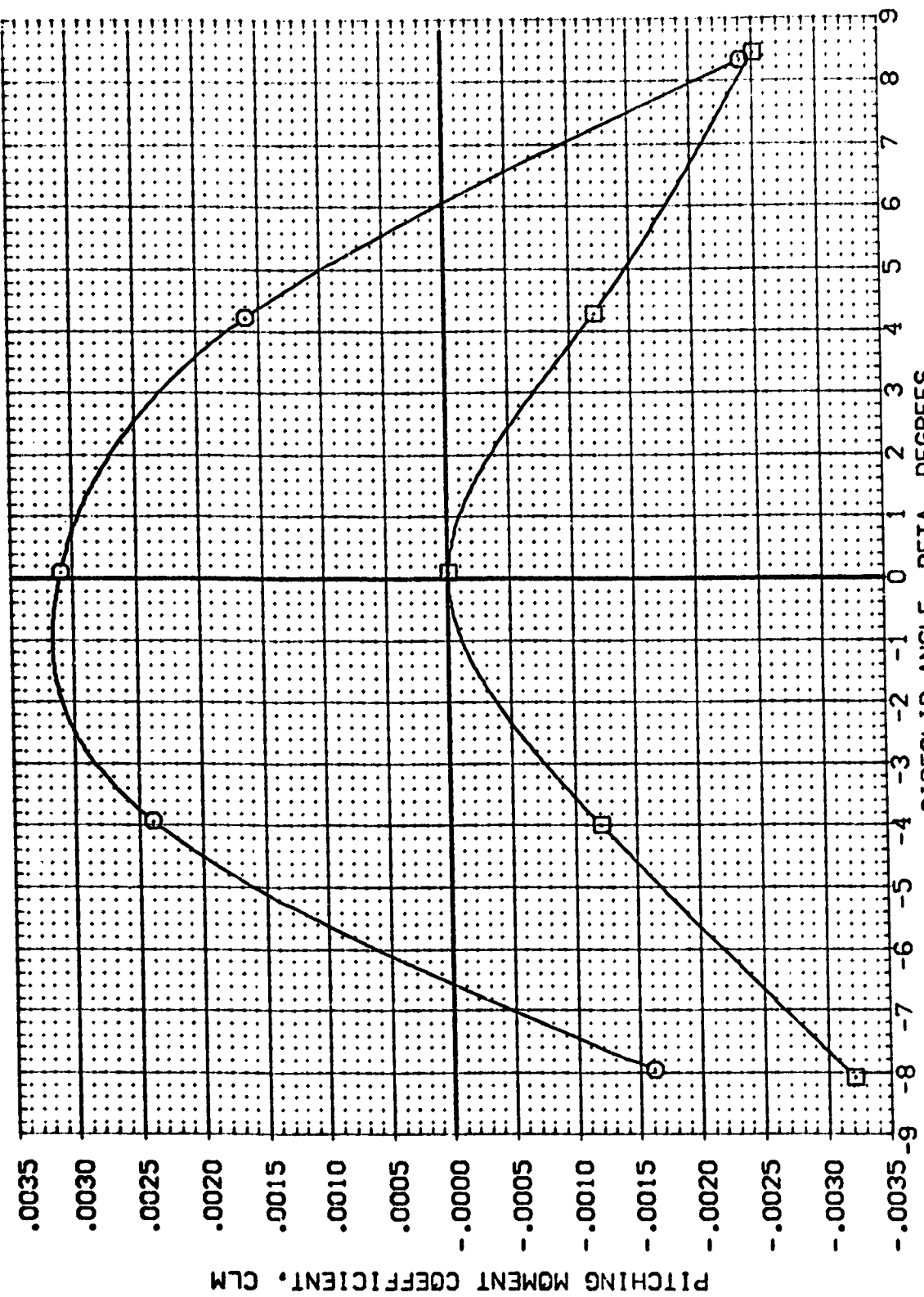


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901

(RBPC12)

AVES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 O .599 .000 ELEVON .000
 I -20.000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 98.8490
 BREF 98.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

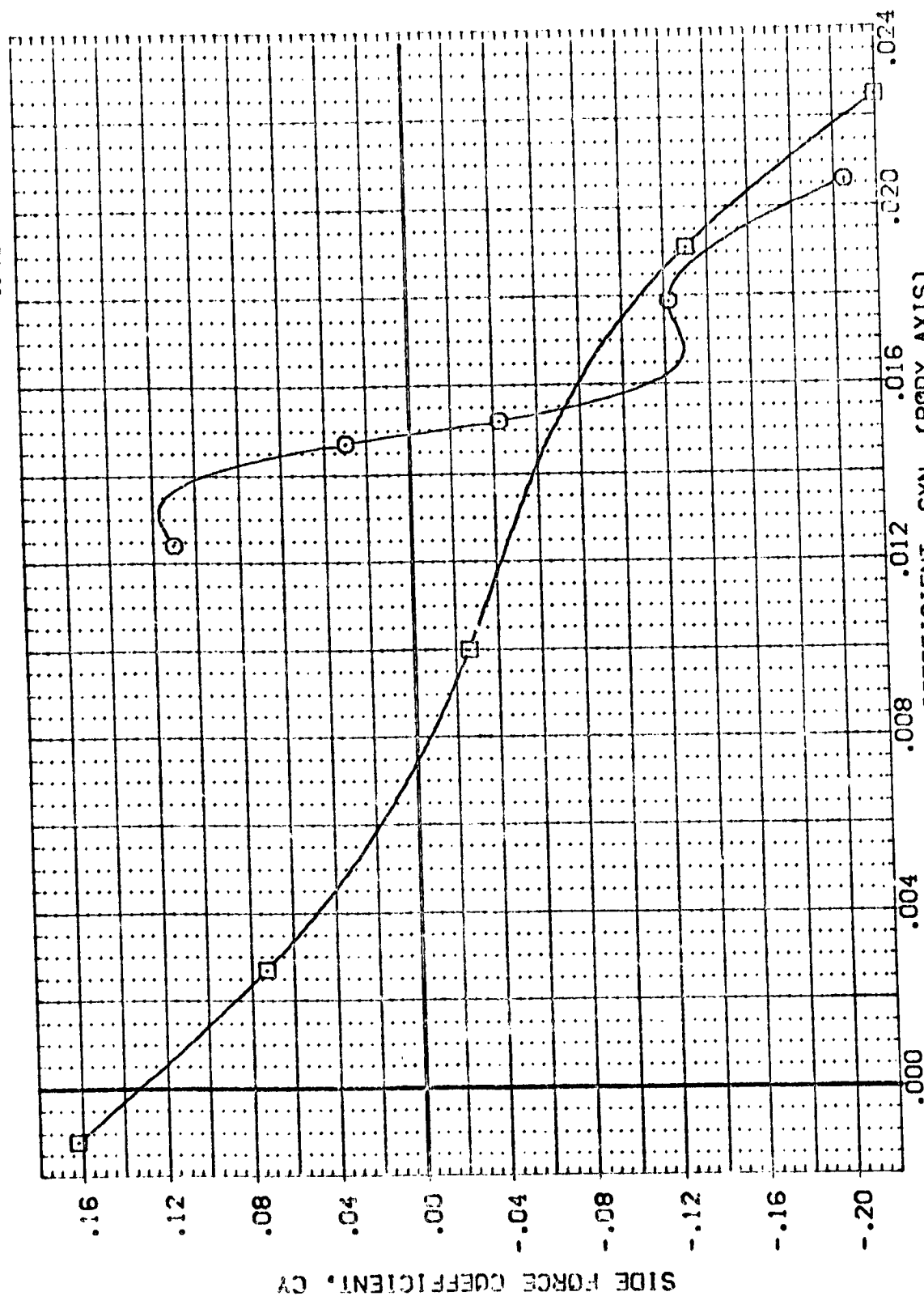


FIG.15 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599, 0.901
 PAGE 136

(ABP012)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	REFERENCE INFORMATION
○	.599			.000	SREF 2.4210
□	.901			.000	REF 39.8490
					REF 39.8490
					XREF 32.3000
					YREF 0.0000
					ZREF 0.0000
					SCALE 0.0000

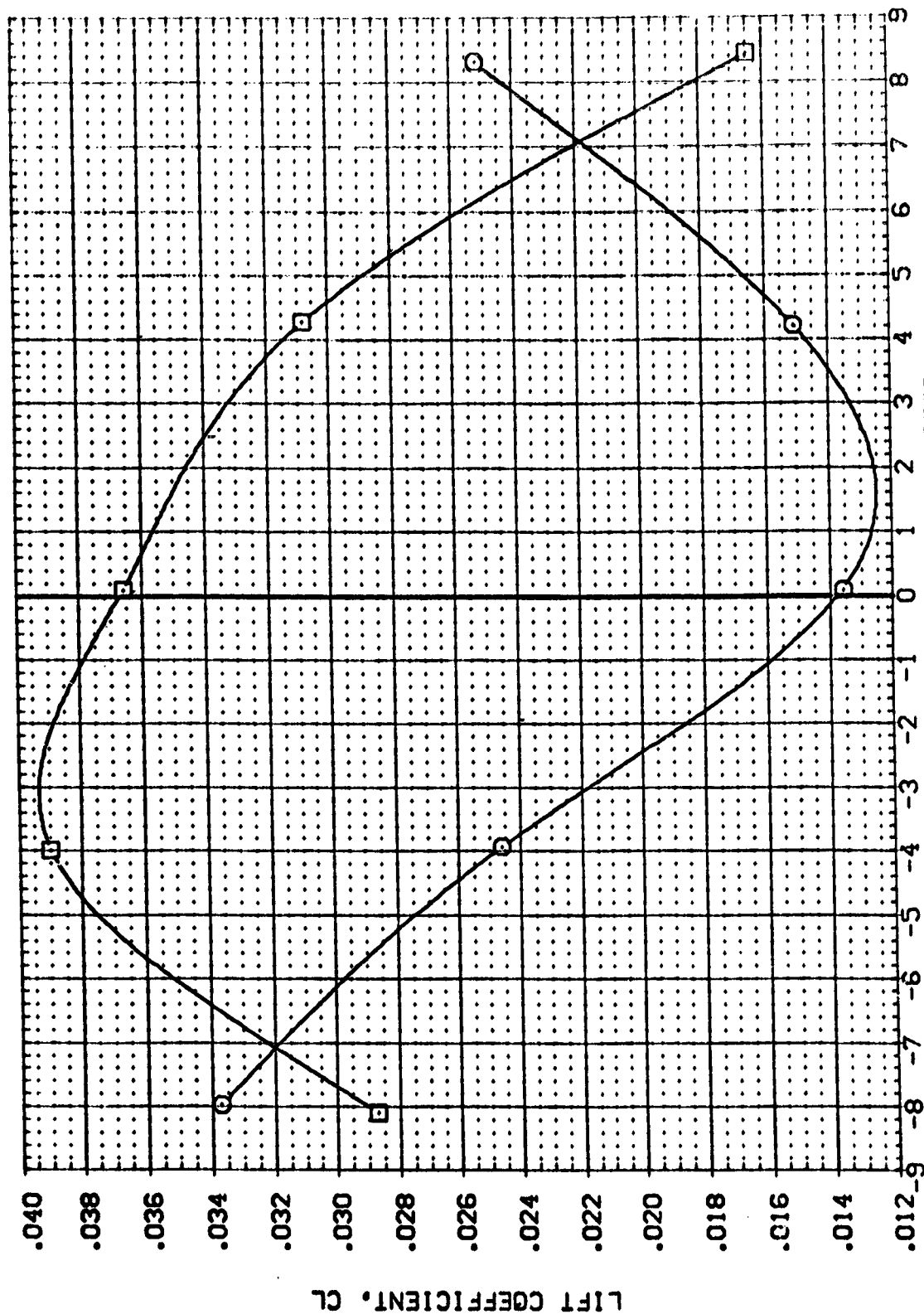


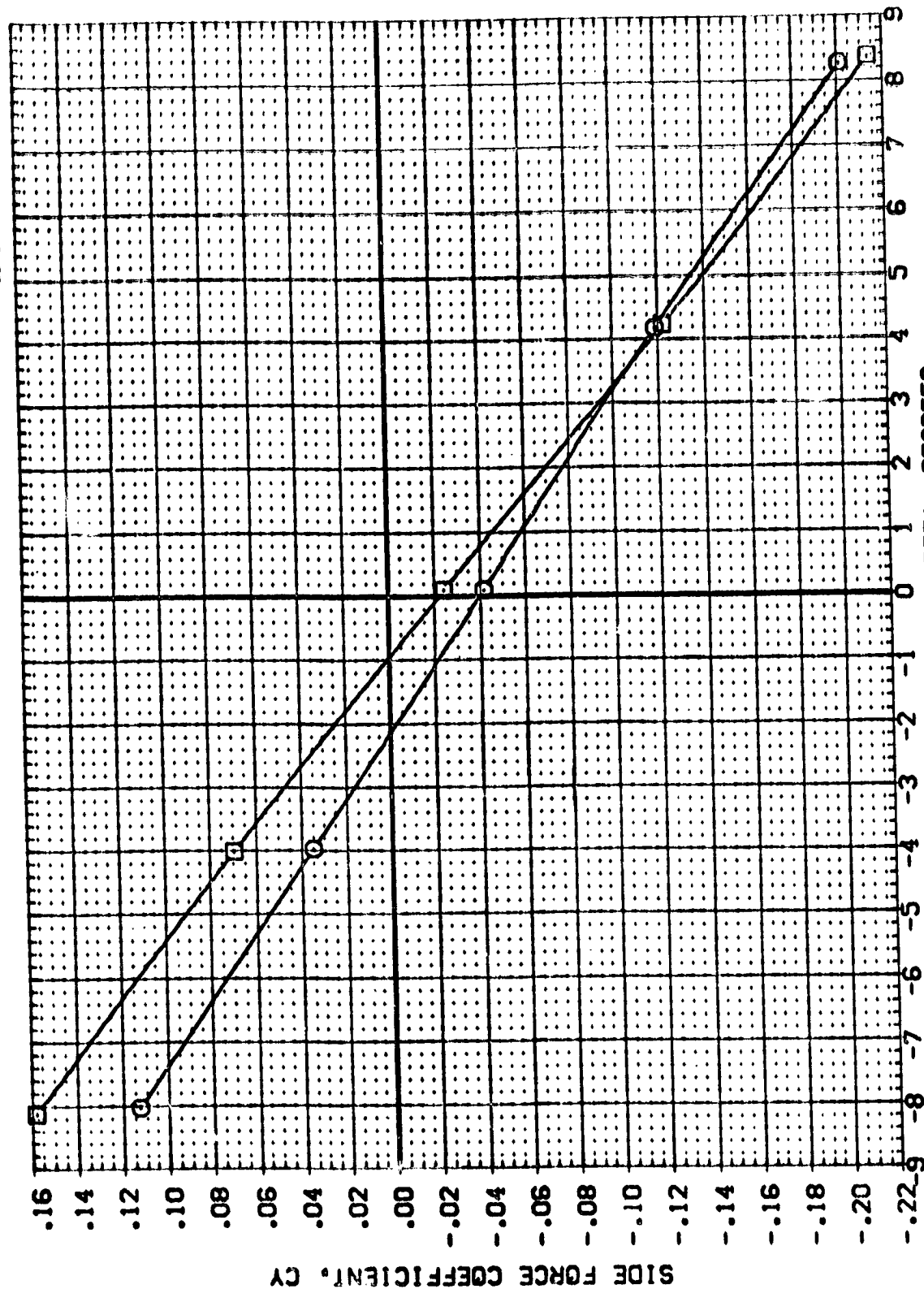
FIG.15 ORBITER LAT-Dir. DATA AT ALPHA=0 DEGS., RUDDER=-20 DEGS., MN=0.599,0.901

(R8P013)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES
O .600 .502
□ 5.000 -20.000
ELEVON RUDFLR
.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8190 IN.
BREF 39.8490 IN.
XREF 32.3000 IN.
YREF .0000 IN.
ZREF .0000 IN.
SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902

(RBPO13)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	ELEVON	RUOFLR	.000	.000
□	.600	5.000	-20.000					
○	.902							

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 28.8450 IN.
BREF 28.6450 IN.
XREF 32.3000 IN.
YREF 2.0000 IN.
ZREF 2.0000 IN.
SCALE 1:500

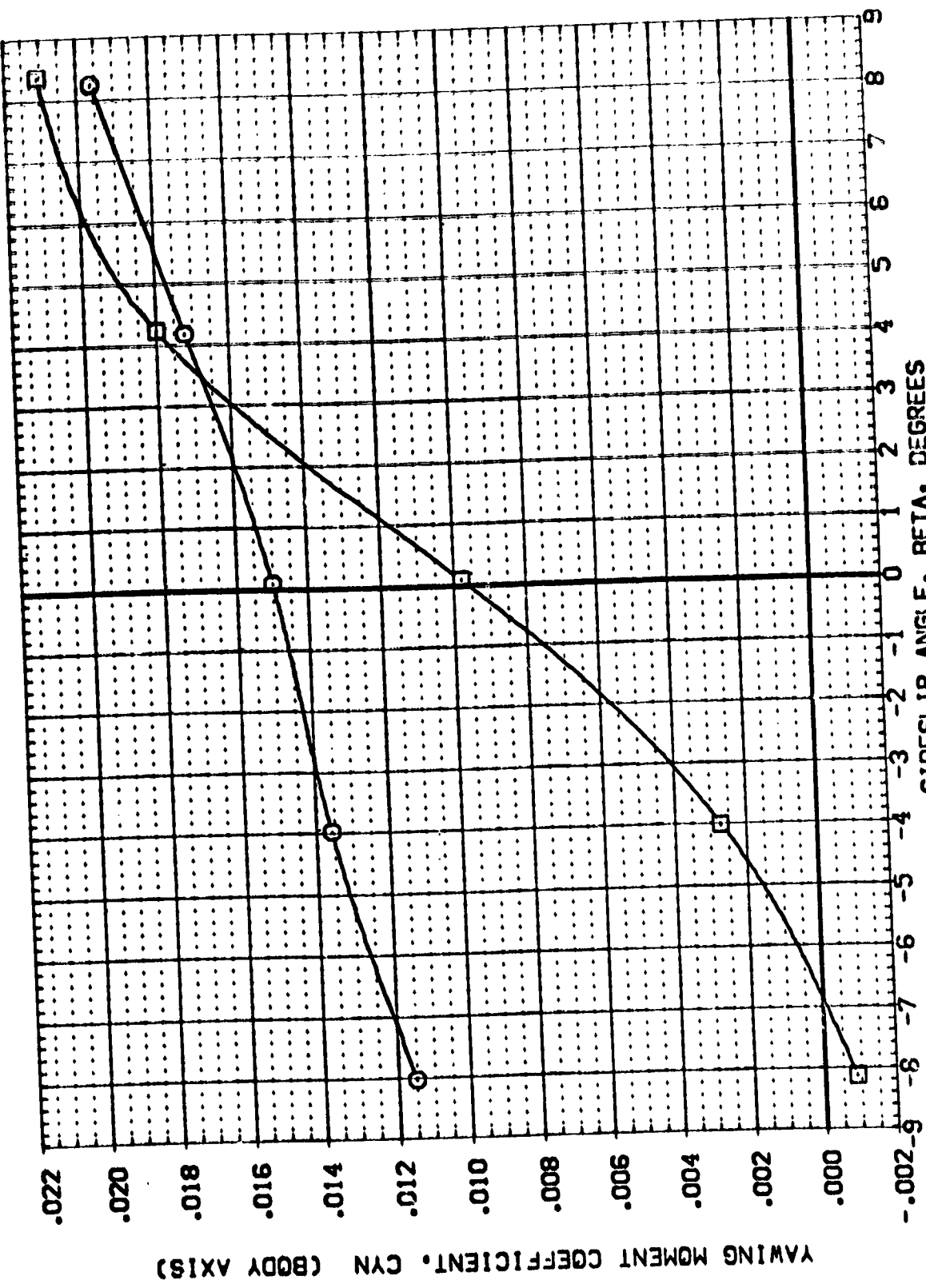


FIG.16 ORBITER LAT-OIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902
PAGE 109

193-0133

AMES 11-707 0A12 02A

SYMBOL	INCH	ALPHA	PARAMETRIC VALUES
□	.600	ALPHA	5.000 ELEVON
□	.902	RJ00R	-20.000 RJ00R

REF ID: A66082



FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., $VN=0.500, 0.502$

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三

(R82013)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES ELEVON RUOFLR .000 .000

REFERENCE INFORMATION
SPEC 2.4210
REF 35.8450
REF 39.8450
REF 32.3000
REF .0000
REF .0000
REF .0000
SCALE

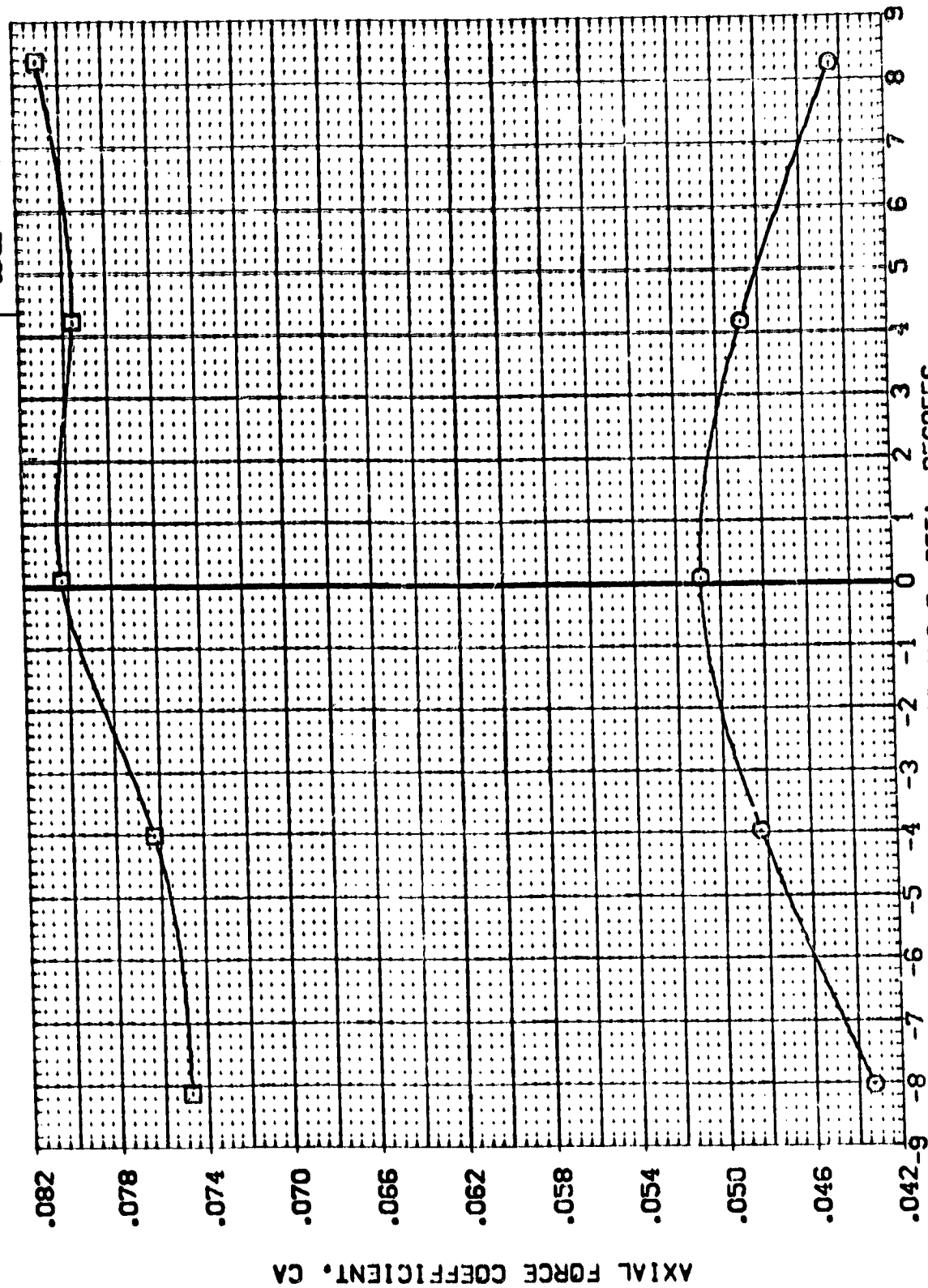


FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902

(RBP013)

ANES 11-707 0A12 02A

SYN-32 0A12-4
PARAMETRIC VALUES
ALPHA 5.000 ELEVON .000
RUDDER -20.000 RUDDER .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 29.8490 IN.
BREF 29.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

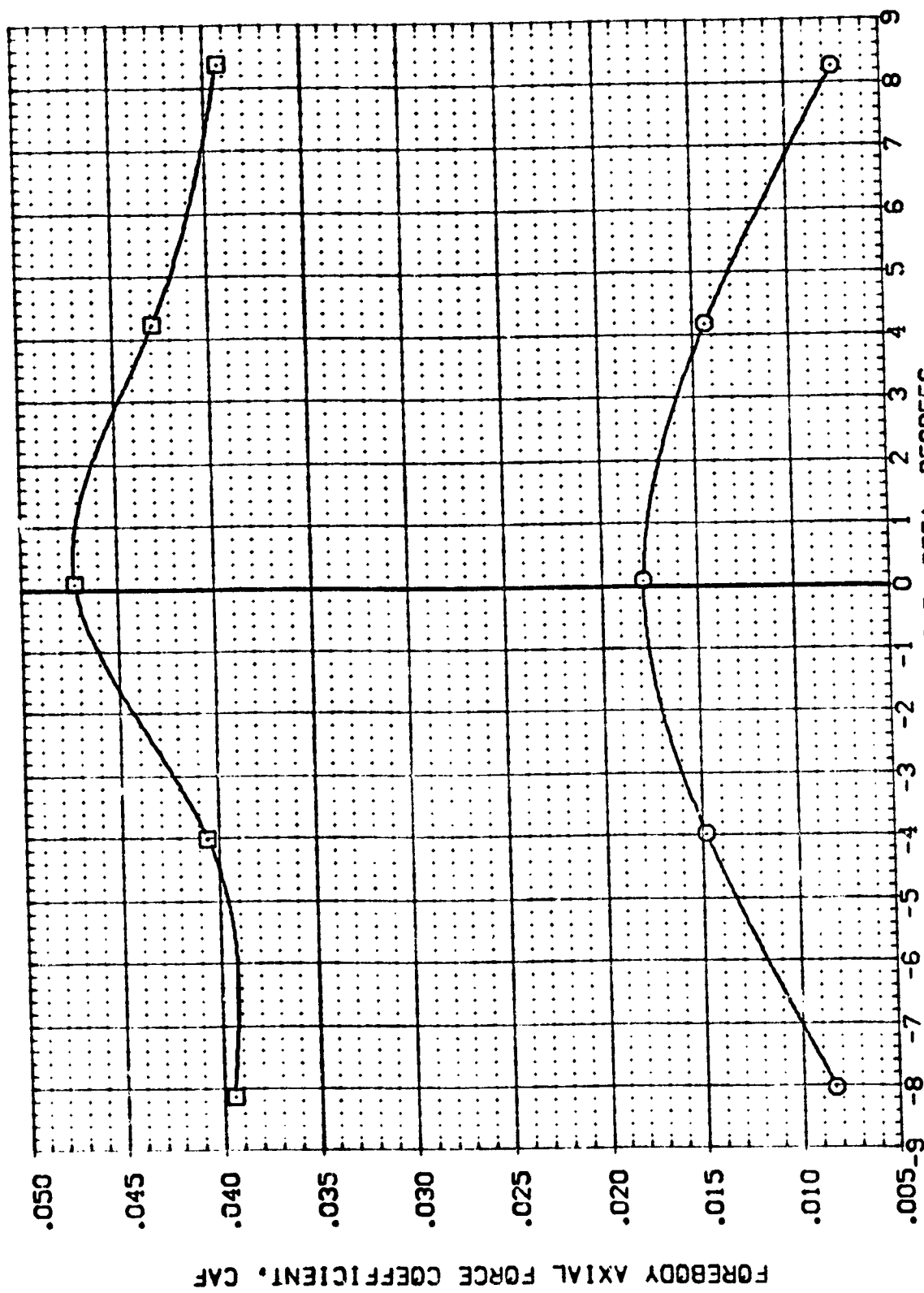


FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600,0.902
SIDESLIP ANGLE, BETA, DEGREES
PAGE 112

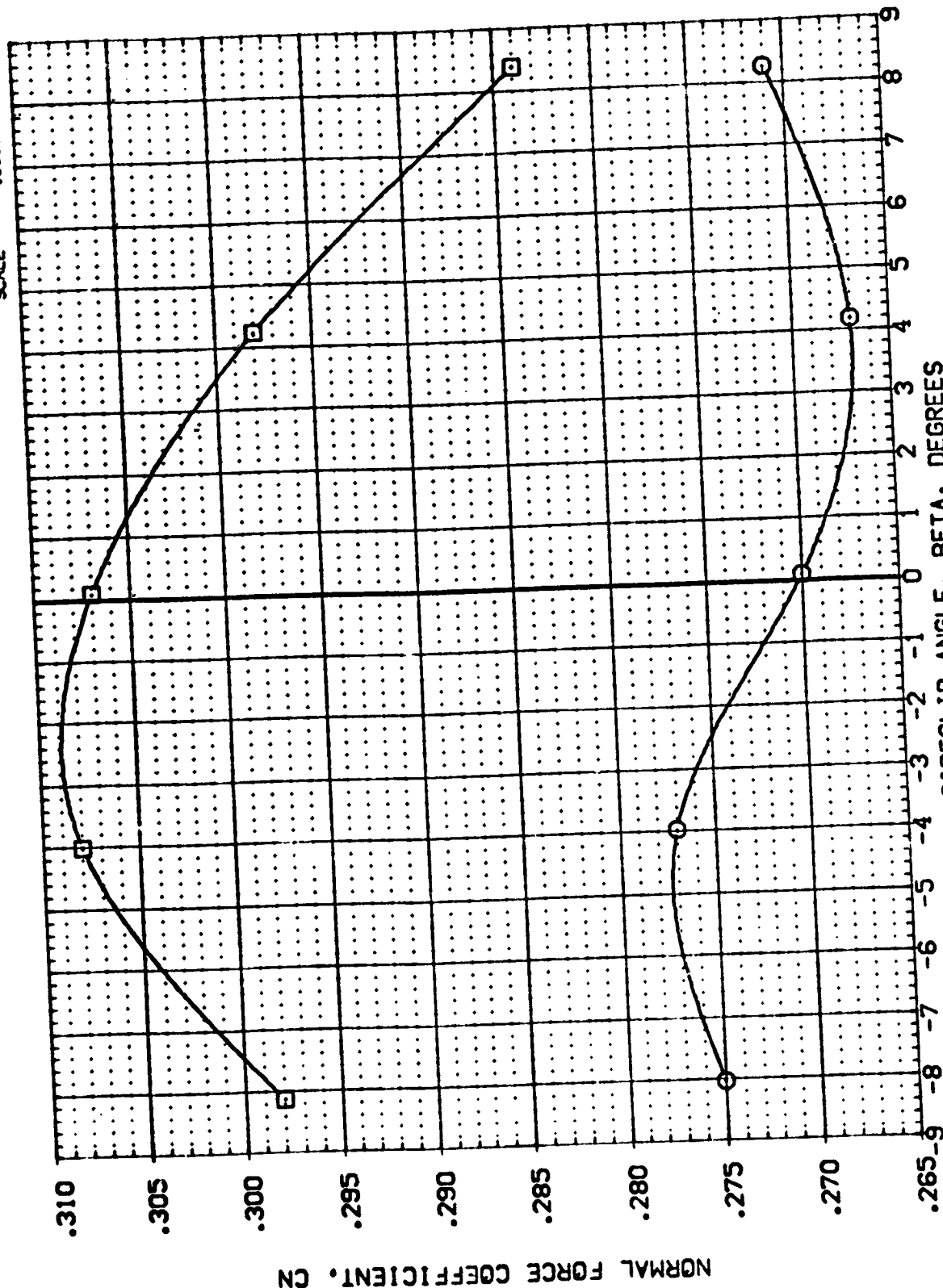
(RBP013)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .902
□ .000 .000

PARAMETRIC VALUES
5.000 ELEVON
-20.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.16 ORBITER LAT-01R. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902

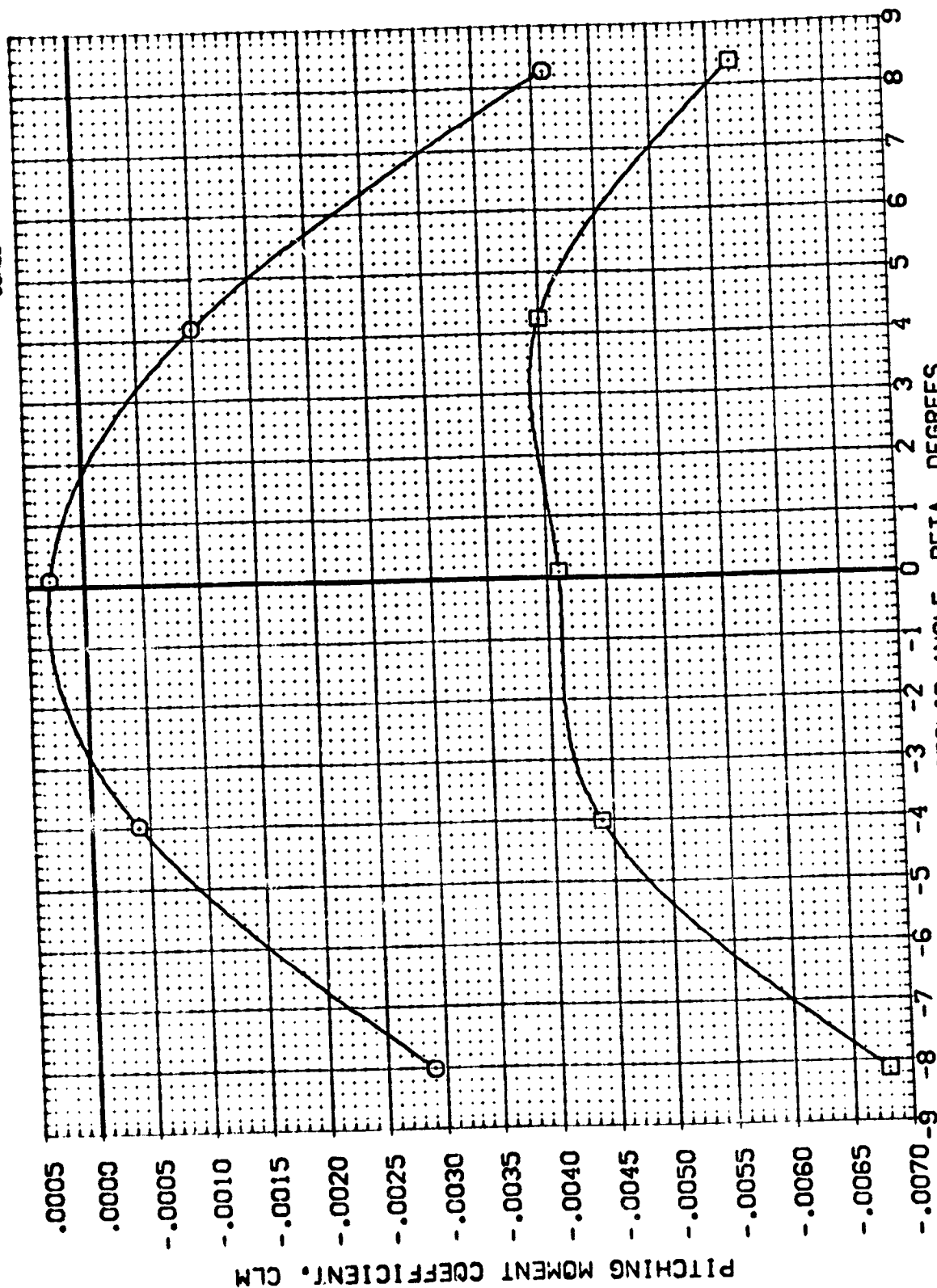
(RBP013)

AMES 11-707 0A12 02A

SYMBOL		MACH		PARAMETRIC VALUES	
				ALPHA	ELEVON
		.600		5.000	.000
		.902		-20.000	.000

REFERENCE INFORMATION

SREF	2.4210	SQ.FT.
LREF	39.8490	IN.
BREF	39.8490	IN.
XMRP	32.3000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0300	SCALE



SIDESLIP ANGLE, BETA, DEGREES

FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902

(RBP013)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR
○ .600 .902
□ .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

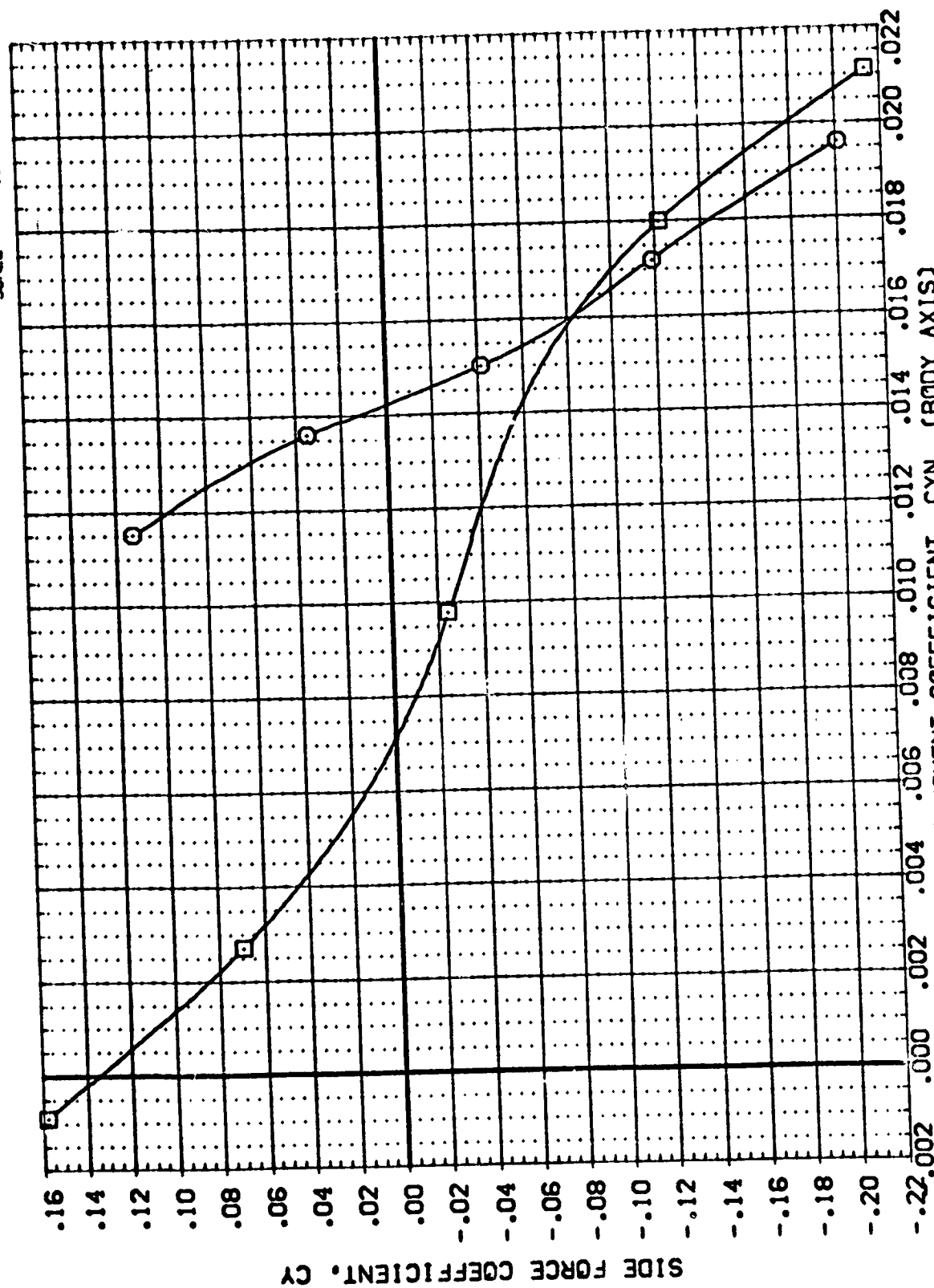


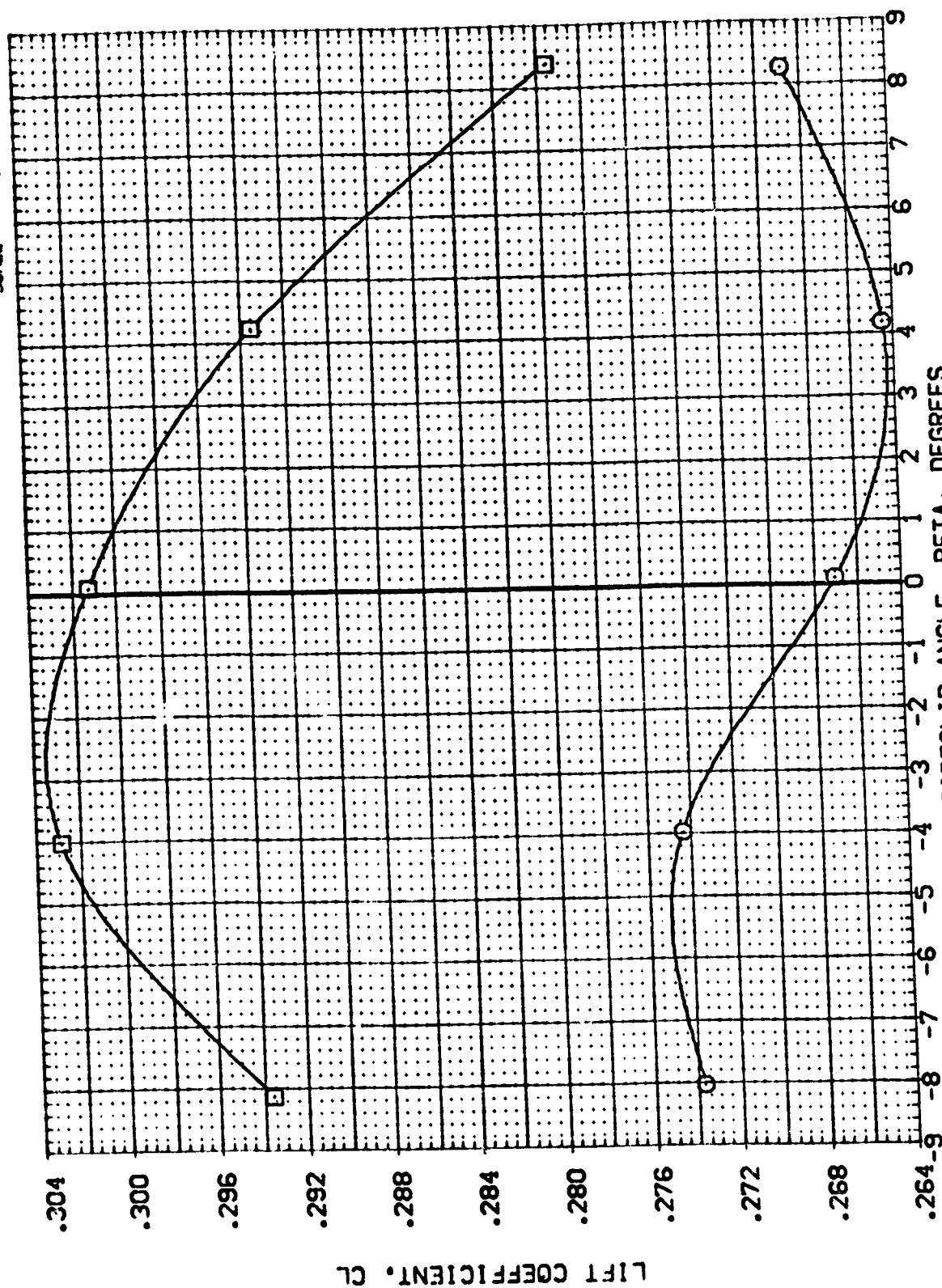
FIG.16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600,0.902
PAGE 115

(ABP013)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 □ .600 .902 -20.000 5.000 ELEVON RUDDER .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8450 IN.
 BREF 39.8450 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG. 16 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.902

(RBPO14)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .599 .936 10.000 -20.000 ELEVON RUOFLR .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.8490
BREF 38.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

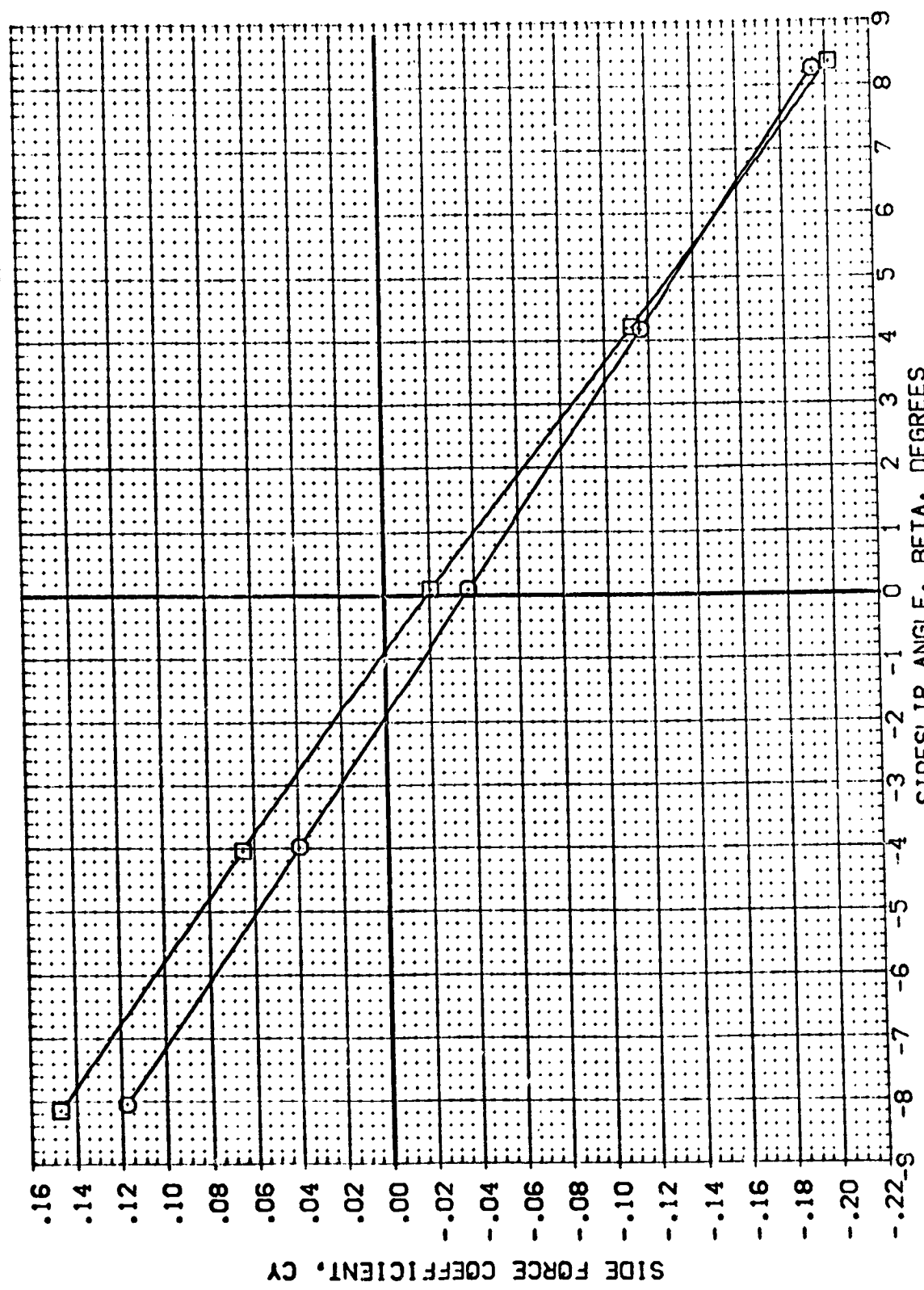


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., MN=0.599, 0.906
PAGE 117

≡

(RBPO14)

AMES 11-707 0A12 02A

MACH		ALPHA		PARAMETRIC VALUES	
SYMBOL	VALUE	VALUE	VALUE	ELEVON	RUDFLR
□	.599	10.000	10.000	.000	.000
□	.926	RUDDER	-20.000	RUDDER	.000

REFERENCE INFORMATION

SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XMRD 32.3000
 YMRD .0000
 ZMRD .0000
 SCALE .0300

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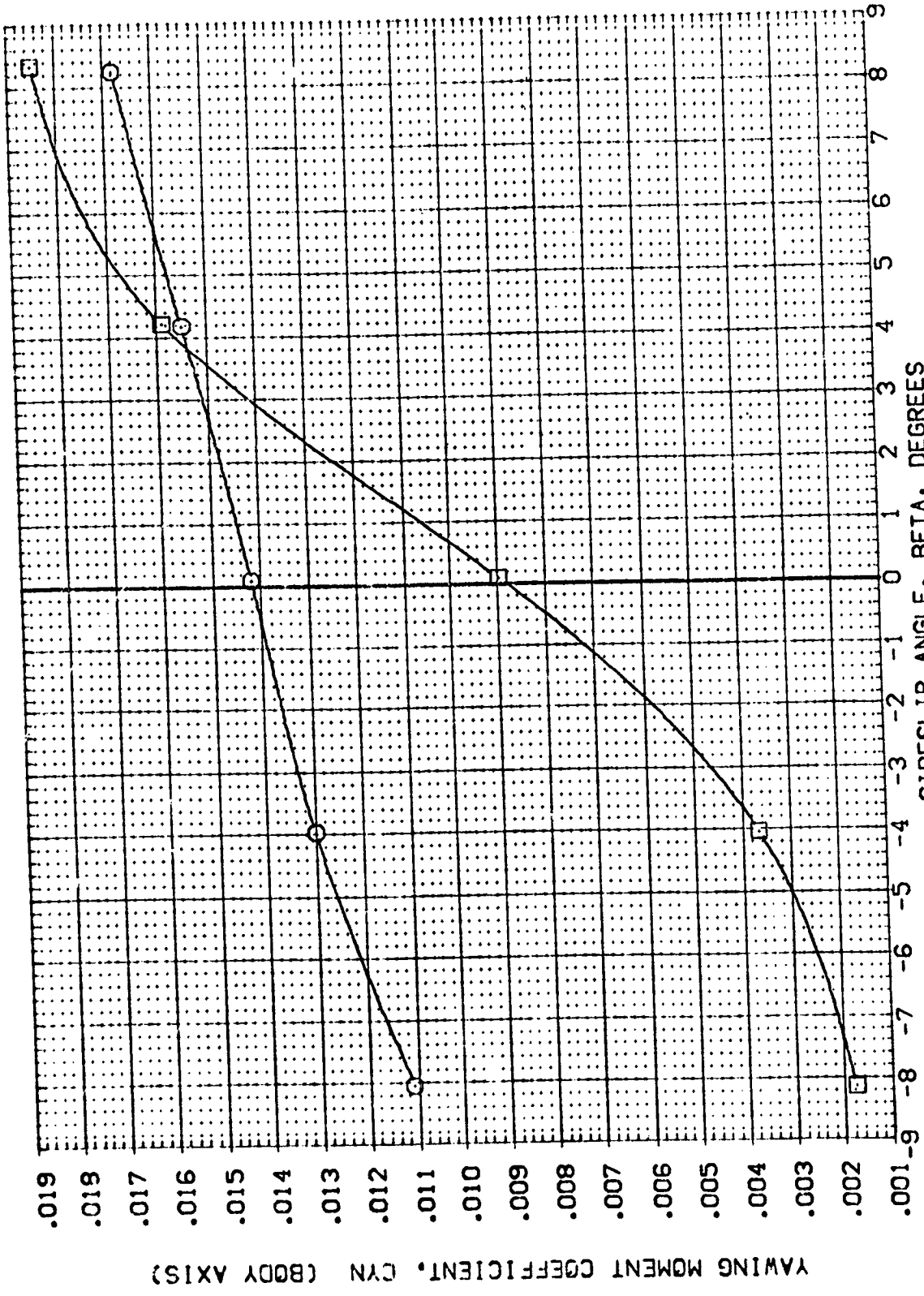


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., MN=0.599, 0.906

PAGE 8



AMES 11-707 0A12 02A

(RBP014)

SYMBOL MACH ALPHA RUDDER
 O .599
 □ .906

PARAMETRIC VALUES
 10.000 ELEVON
 -20.000 RUDDLR

REFERENCE INFORMATION
 SREF 2.4210 SS.FT.
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP 1.0000
 ZMRP 1.0000
 SCALE .0300

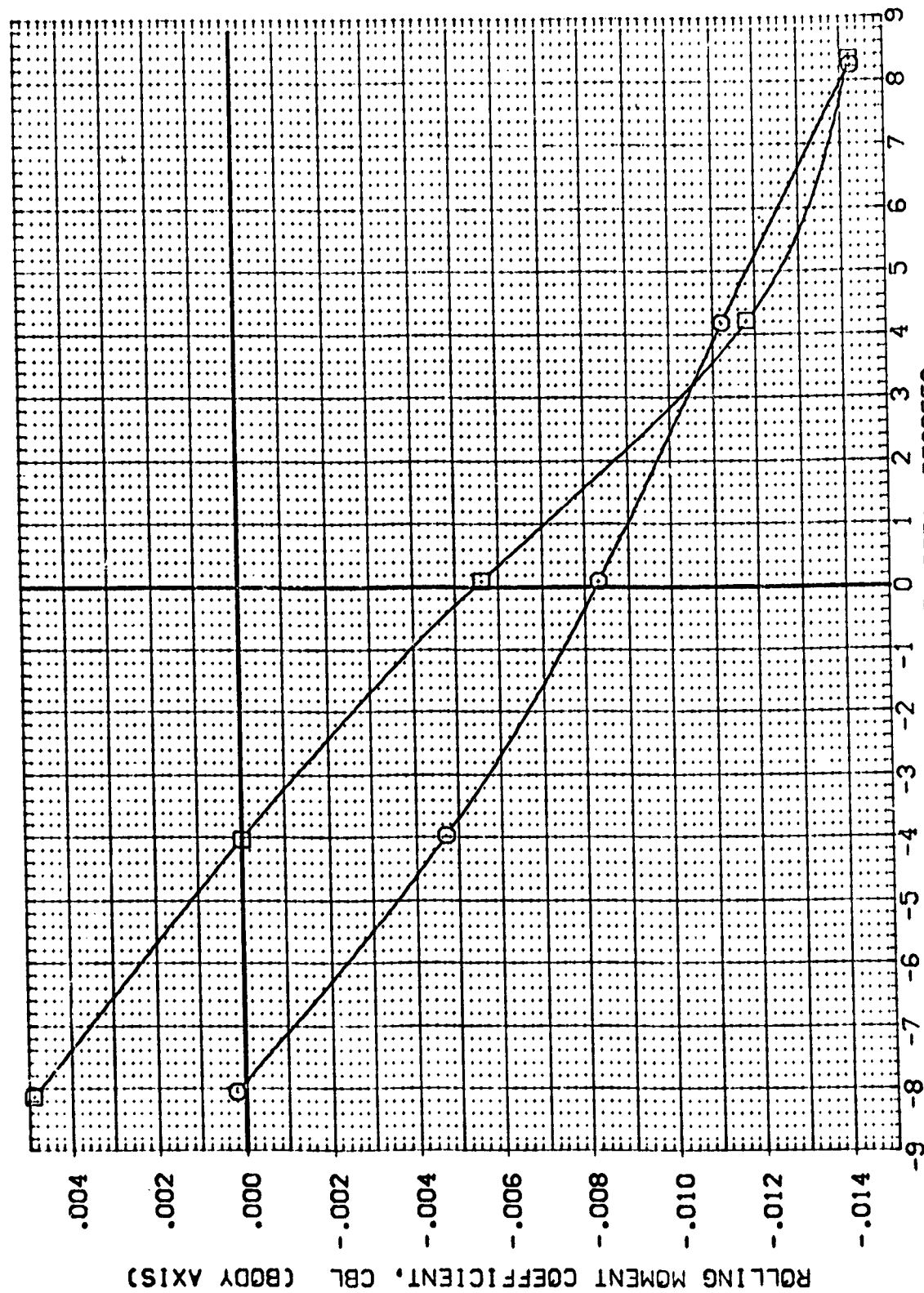


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., MN=0.599,0.906

(RBPO14)

AMES 11-707 0A12 02A

SYMBOL
□

MACH
.599
.906

PARAMETRIC VALUES
ALPHA 10.000
ELEVON -20.000
RUDELR .000

.000
.000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8480
BREF 38.8480
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

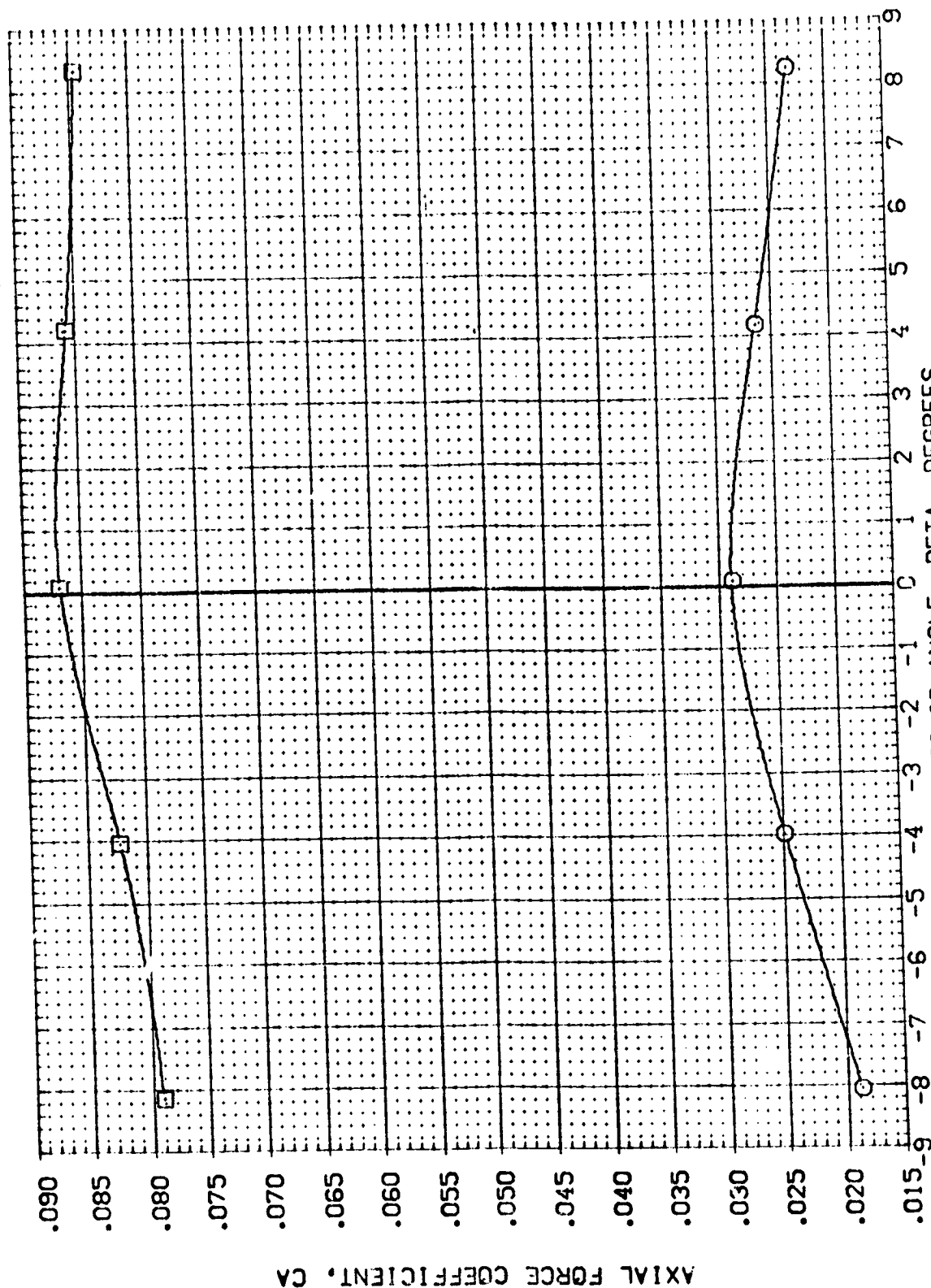


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., MN=0.599, 0.906

(RBP014)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
.598 .908 .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210
REF 38.8500
REF 38.8500
XREF 32.3000
YREF 11.0000
SCALE 1000

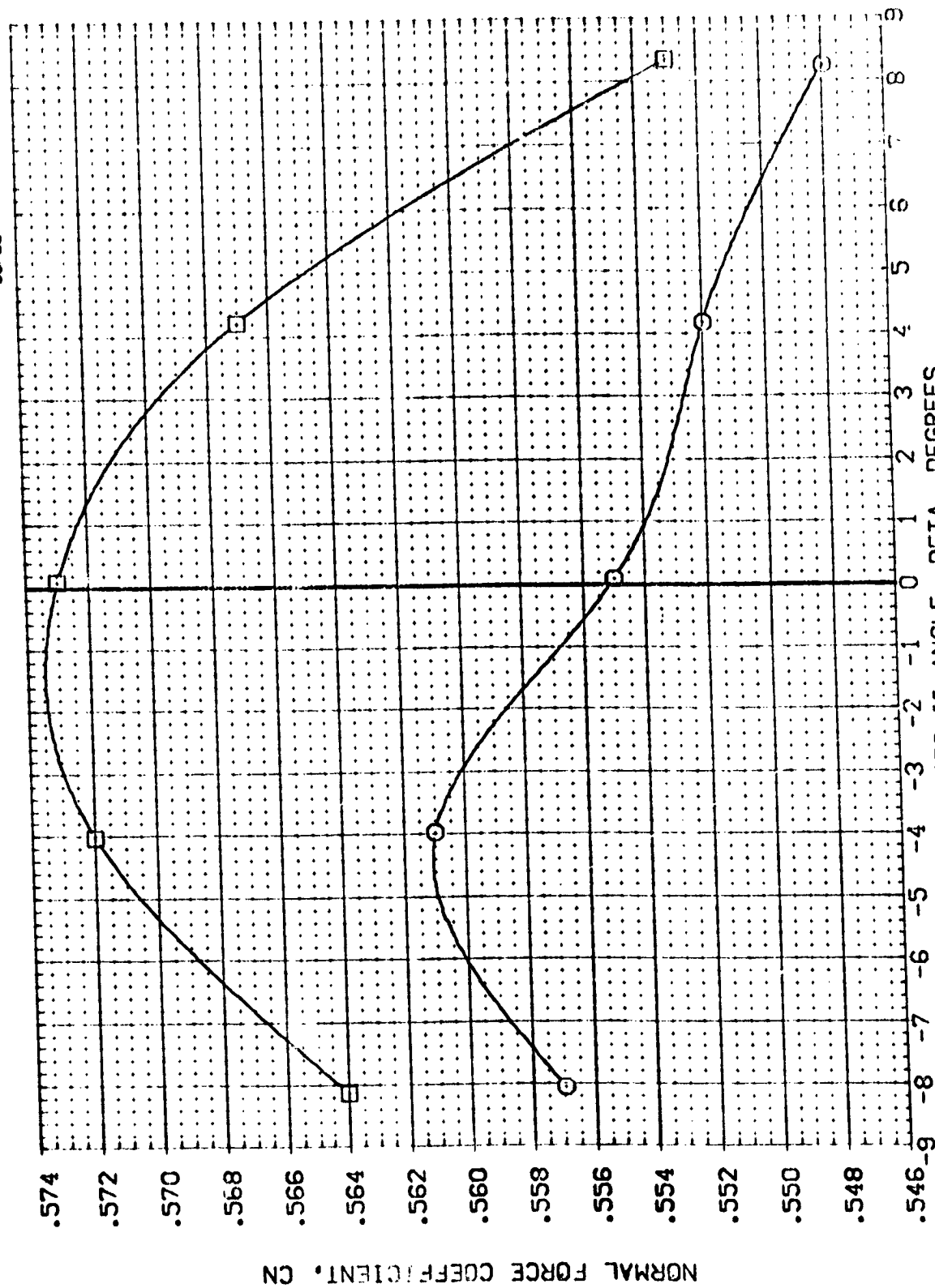


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., $MN=0.598, 0.908$

(RBP014)

AMES 11-707 3A12 02A

SYMBOL MACH .599 ALPHA 10.000 ELEVON .000
 RUDER -20.000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8450
 BREF 38.8450
 VREF 32.3000
 ZREF .0000
 SCALE .0001

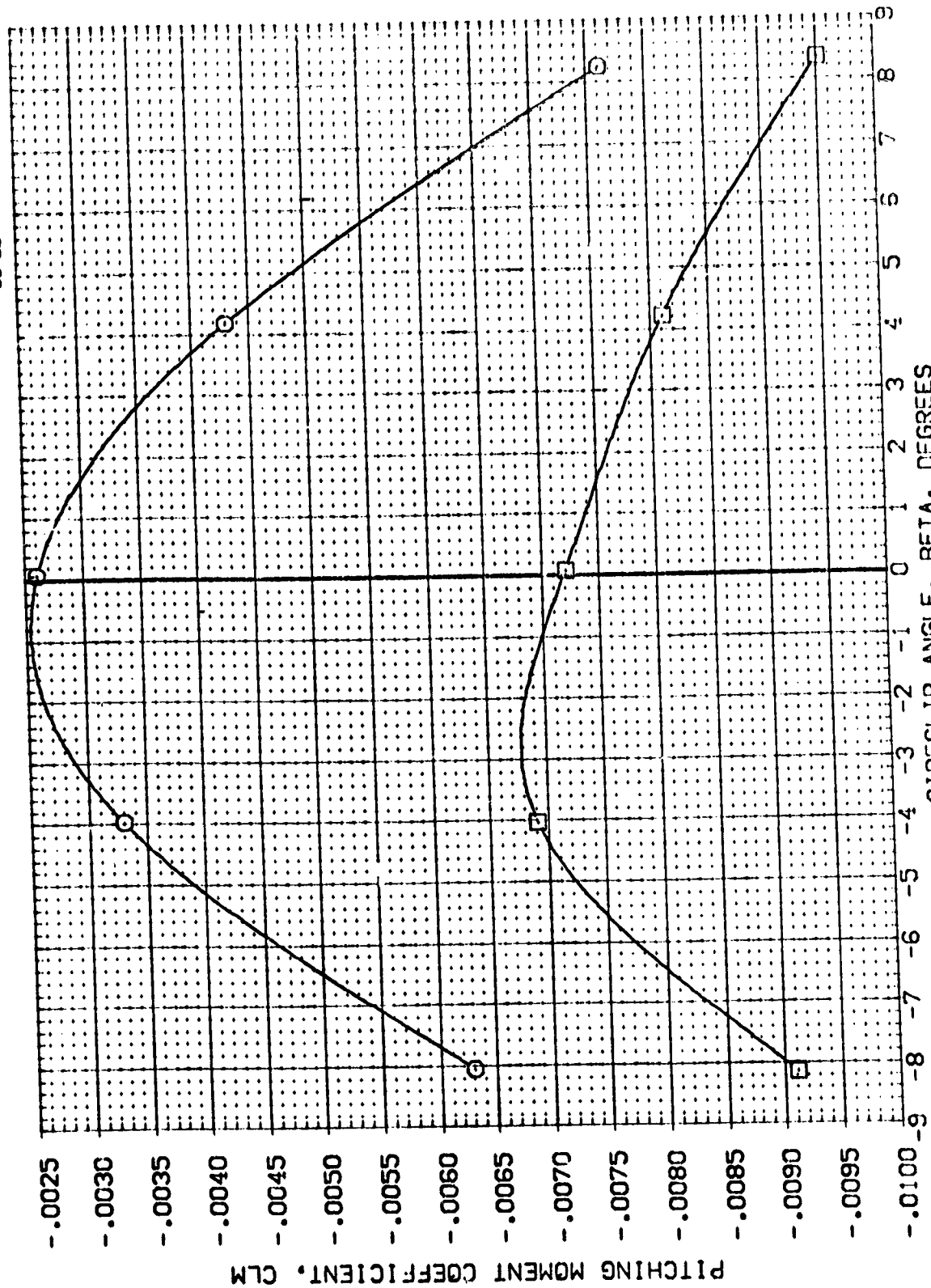


FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS., $M=0.599$, $C=0.903$
 D=SE 123

0330:40

AMES 11-707 0A12 02A

PARAMETRIC VALUES	MAC=	SYMBOL
ALPHA	.599	OL
RODDER	.975	
ELEVEN		
RODCLR		
-20.000		
:0.000		

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FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDER=-20 DEGS.,
YAWING MOMENT COEFFICIENT, C_Y 0.000, 0.000, 0.000
W=0.000, 0.000, 0.000
PAGE 107

CA320143

AMES 11-707 0A12 02A

SYMBOL

505.
506.
507.

PARAMETRIC VALUES	
ALPHA	10.000
B	-20.000
ELEVON	0.000
RUDFLR	0.000

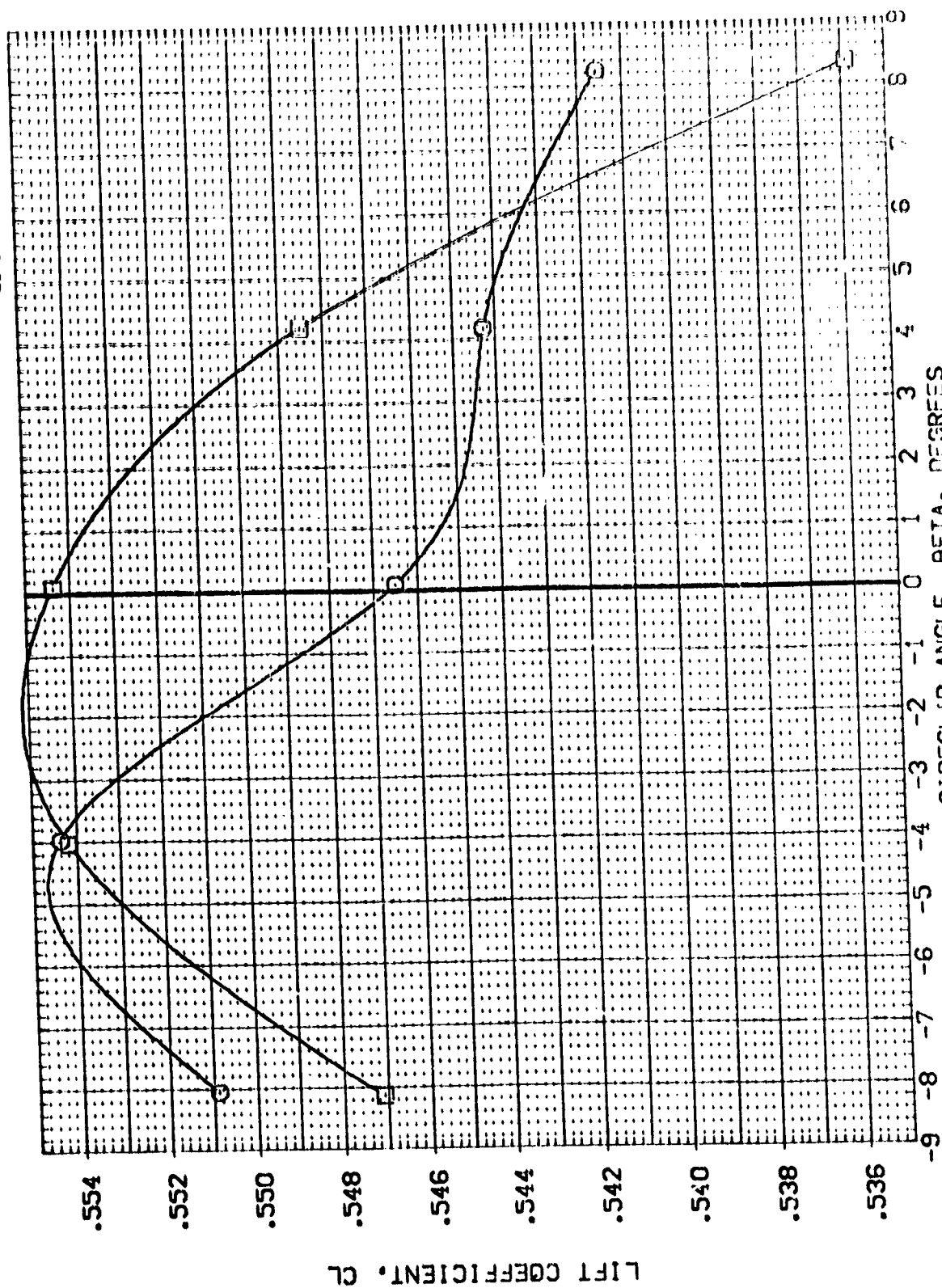
[illegible]

FIG.17 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RODDER=-20 DEGS.,
SIDESLIP ANGLE, BETA, DEGREES
W=0.333,0.333
PAGE 125

(RBPC015)

AMES 11-707 CA12

SYMBOL WACH PARAMETRIC
ALPHA .000
RUDDER -20.000

REFERENCE INFORMATION
SPREF 2.4210
LREF 38.8560
BREF 38.8460
XREF 32.3300
YREF 32.3300
ZREF 32.3300
SCALE



FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., $MN=0.600, 0.901$

(RBPC015)

AVES 11-707 0A12 02A

SYNOPSIS		PARAMETRIC VALUES	
WAC	ALPHA	15.000	ELEVON .000
WAC	RUDDER	-20.000	RUDDER .000

REFERENCE INFORMATION

SREF	2.4210
LREF	39.8450
BREF	39.8450
XV00	32.3000
YV00	0.0000
ZV00	0.0000
SCALE	0.0300

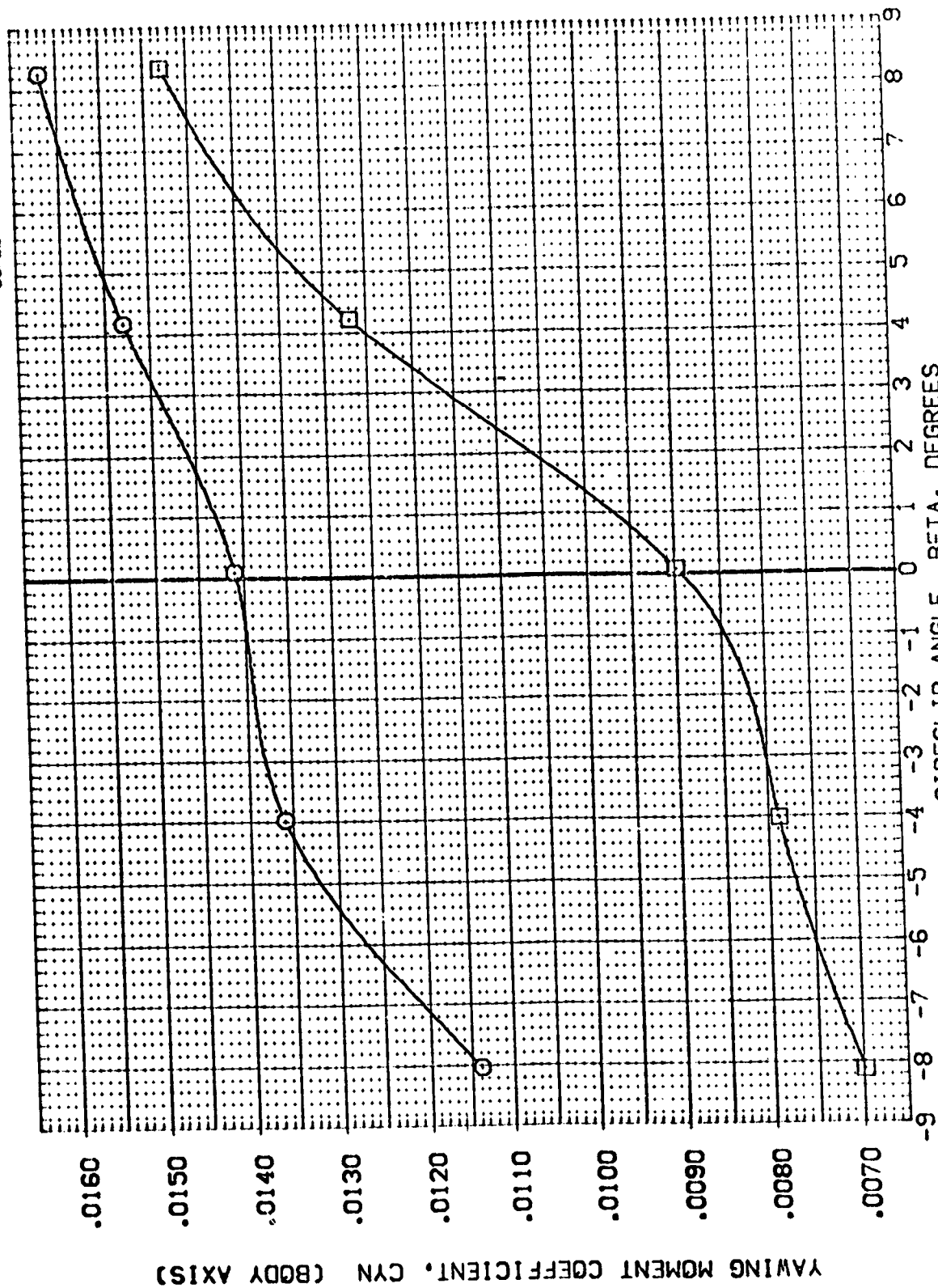


FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., $MN=0.600, 0.901$



(RBPO15)

AVES 11-707 CA12 02A

SVGC	WICH	ALPHA	PARAMETRIC VALUES	.000
0	.600	RUDDER	:5.000 ELEVON	.000
	.901		-20.000 RUOFLR	

REFERENCE INFORMATION

SREF	2.4210	SCALE
LREF	39.8490	
BREF	39.8450	
XMRP	32.3000	
YMRP	0.0000	
ZMRP	0.0000	
SCALE	0.0000	



FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., MN=0.600,0.901

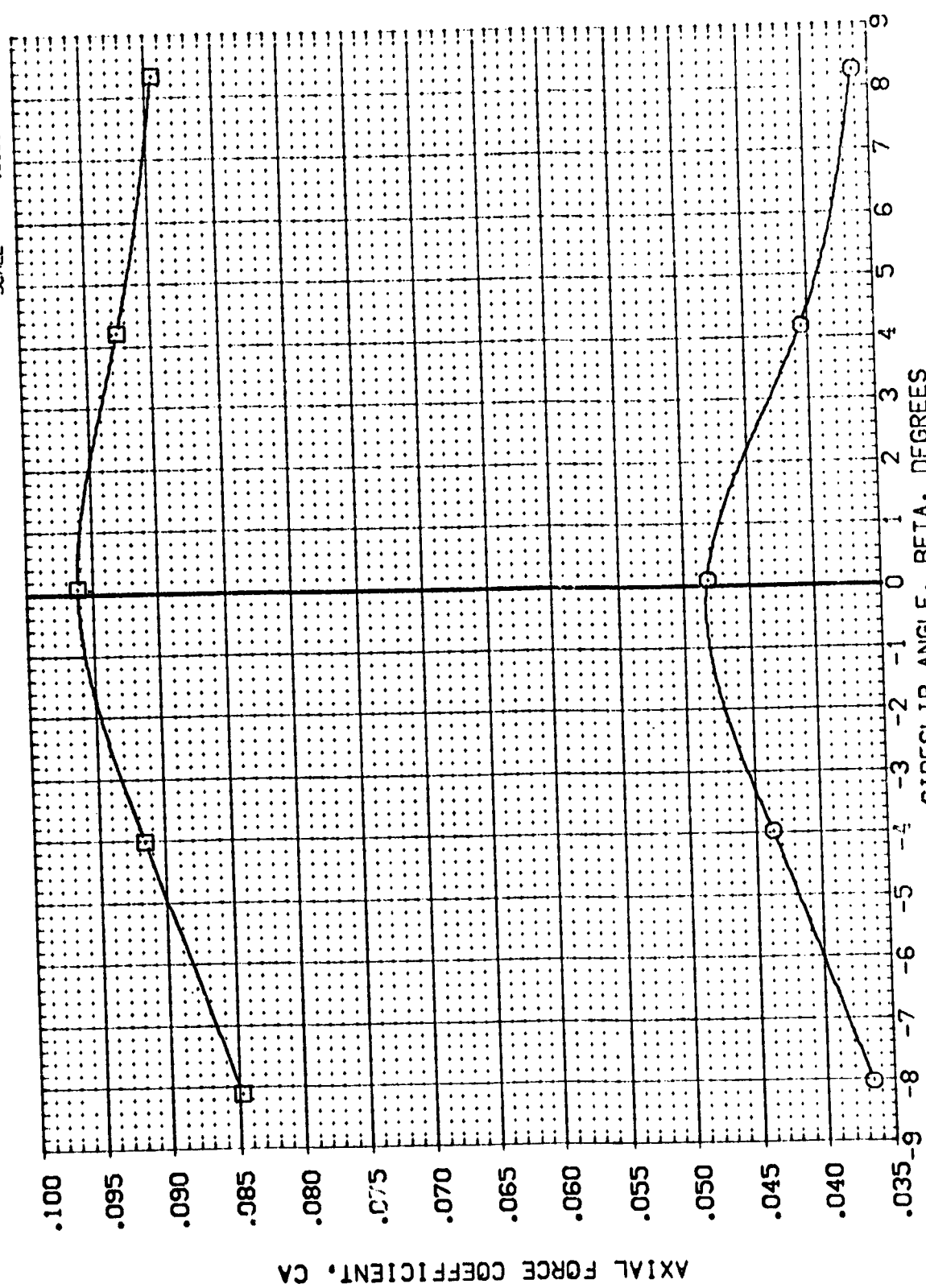


[RBPO15]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
[] .600 .901 15.000 -20.000 ELEVON RUOFLR
.000 .000

REFERENCE INFORMATION
SRCE 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., MN=0.600, 0.901



(RBP015)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
 .500 ALPHA 15.000 ELEVON .000
 .901 RUDDER -20.000 RUDDLR .000

REFERENCE INFORMATION
 SREF 2.4212 SQ.FT.
 LREF 98.8455
 BREF 98.8455
 XVRP 32.3000
 YVRP .0000
 ZVRP .0000
 SCALE .0300

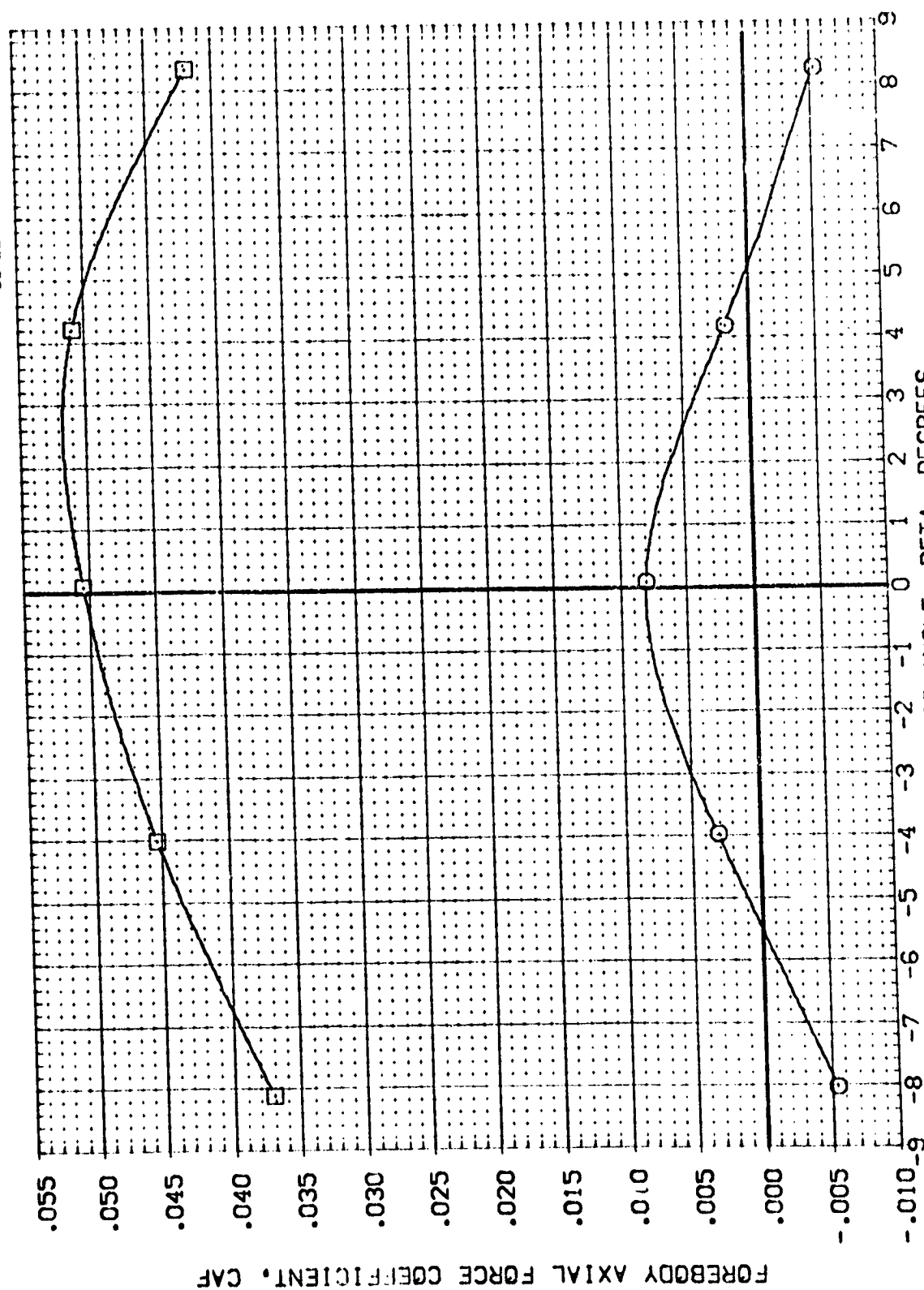


FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., $VN=0.600, 0.901$



AVES 11-707 0A12 02A

(RBP015)

SYMBOL	MACH	PARAMETRIC VALUES		REFERENCE INFORMATION	SQ.FT.
		ALPHA	ELEVON		
[]	.600	15.000	.000	SREF	2.4210
[]	.800	RUDDER	.000	LREF	39.8400
				BREF	39.8400
				XREF	32.0000
				YREF	1.0000
				ZREF	1.0000
				SCALE	1.0000

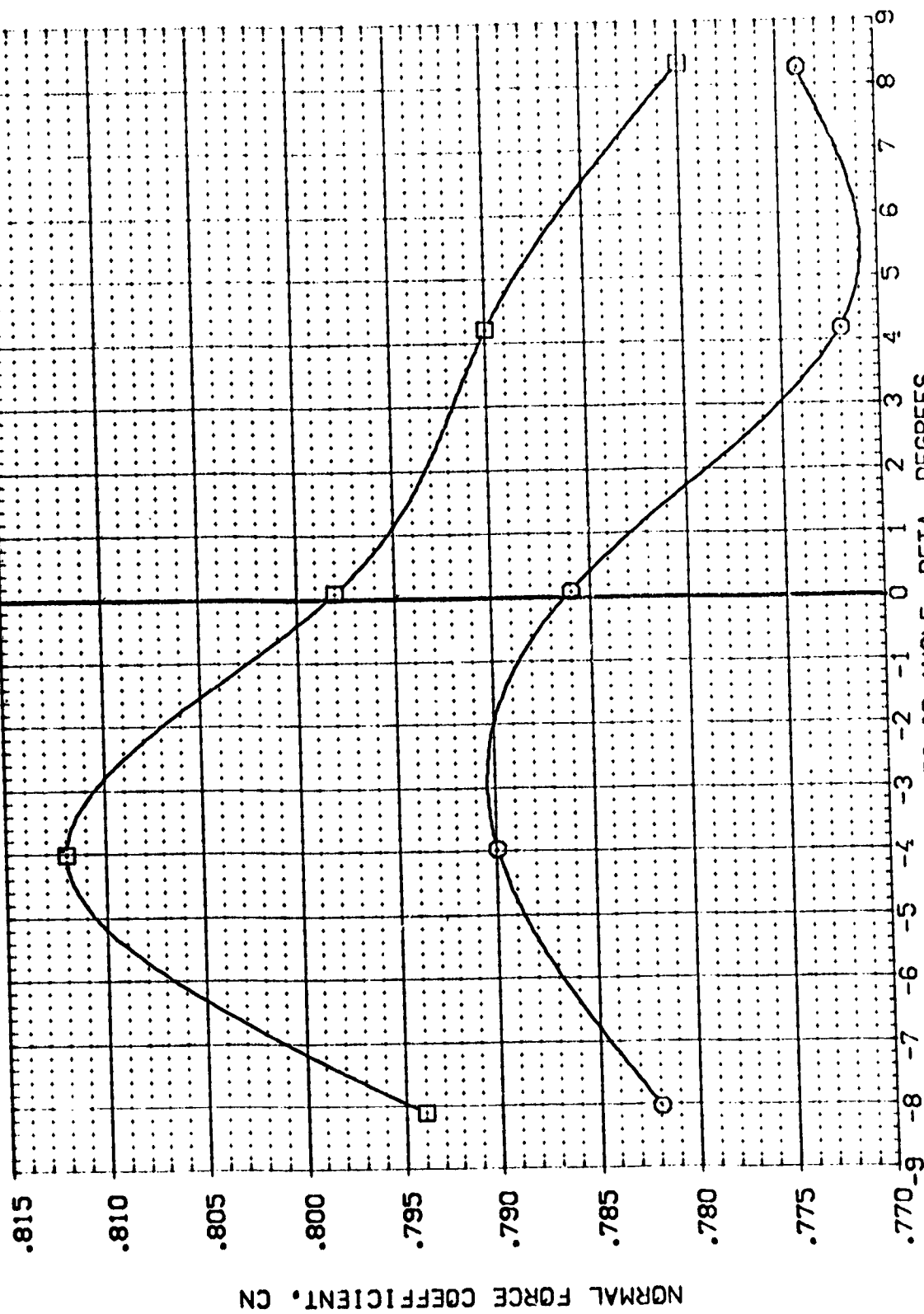


FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., VN=0.600, 0.801
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 13:

(RBPO15)

AVES 11-707 0A12 02A

SYNCD MACH .800
ECC .800
ALPHA 15.000
RUDDER -20.000
ELEVON .000
RUEFLR .000

PARAMETRIC VALUES

REFERENCE INFORMATION
SREF 2.4210
REF 36.8460
SREF 39.8460
XREF 32.0000
VREF 32.0000
ZREF 32.0000
SCALE 3300

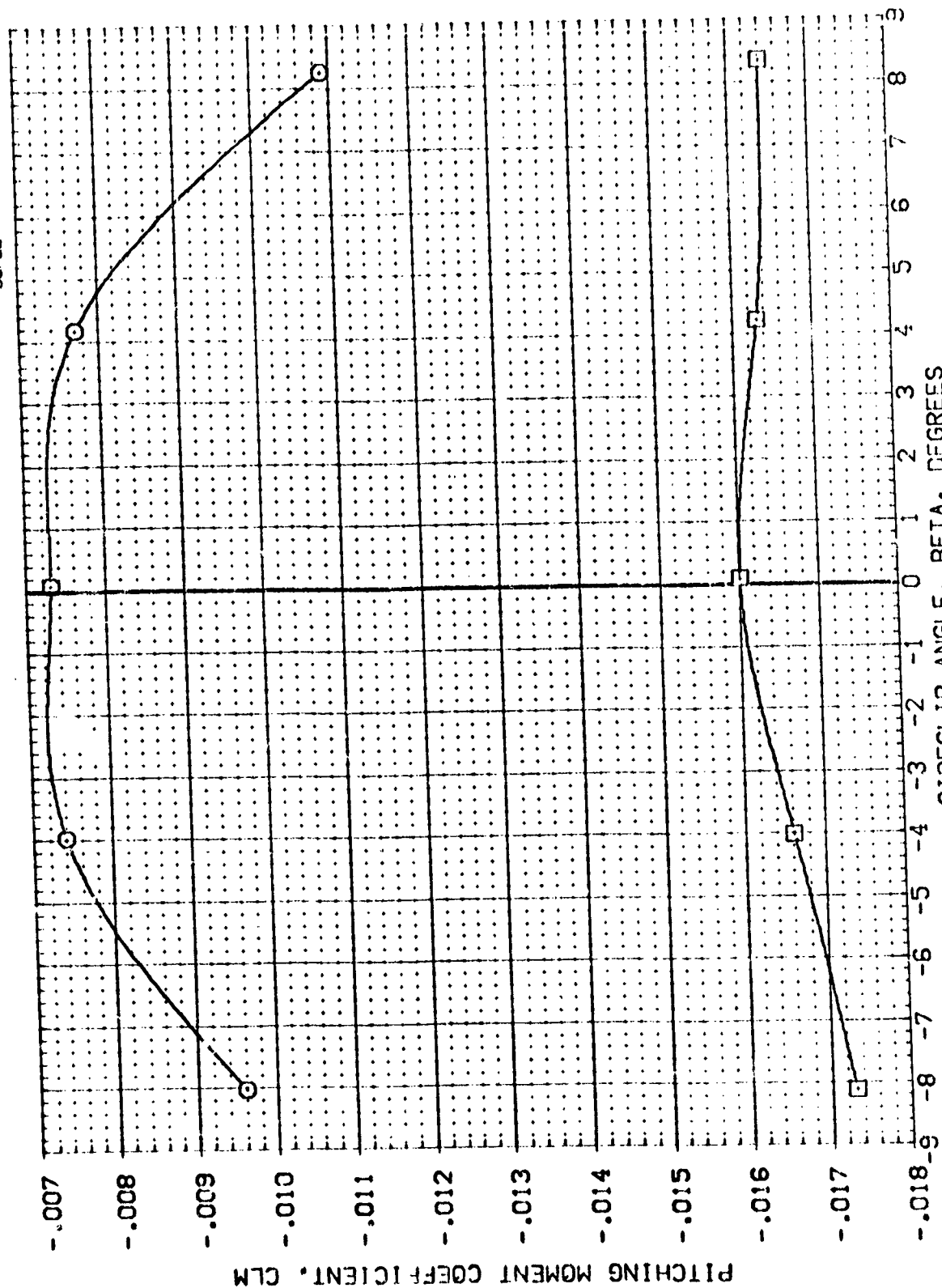


FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., $V_N=0.800, 0.901$
PAGE 132

(RBP015)

AMES 1:-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
.800 .000 15.000 ELEVON .000
.901 -20.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8400
BREF 38.8400
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

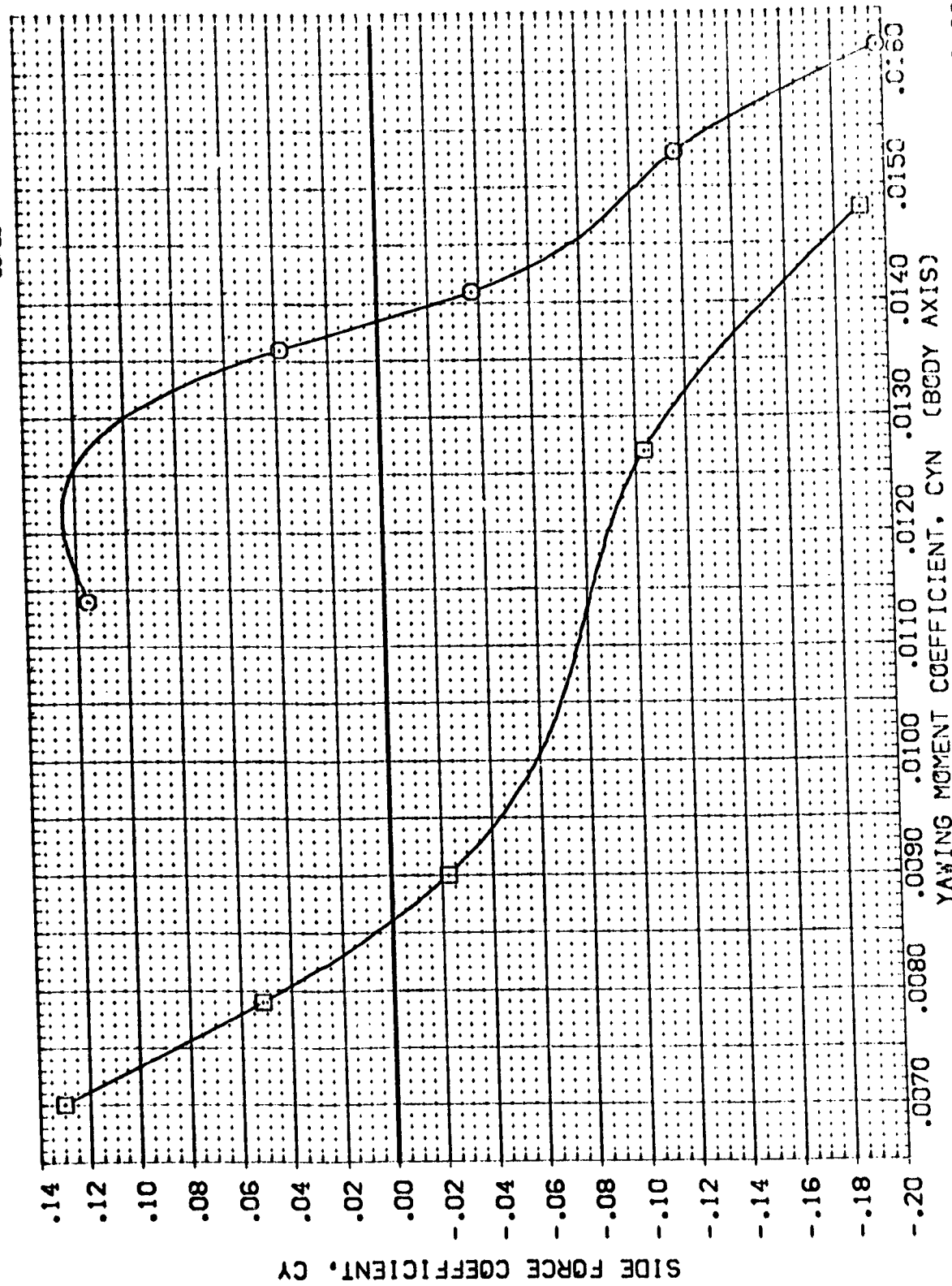


FIG.18 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., YN=0.800, 0.901
PAGE 133



AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 10 .800 .901 15.000 ELEVON .000
 10 .901 -20.000 RUDDLR .000

(ABPO15)

REFERENCE INFORMATION
 SREF 2.42
 LREF 38.846
 BREF 38.846
 YREF 32.0
 ZREF 0.0
 SCALE 1.000

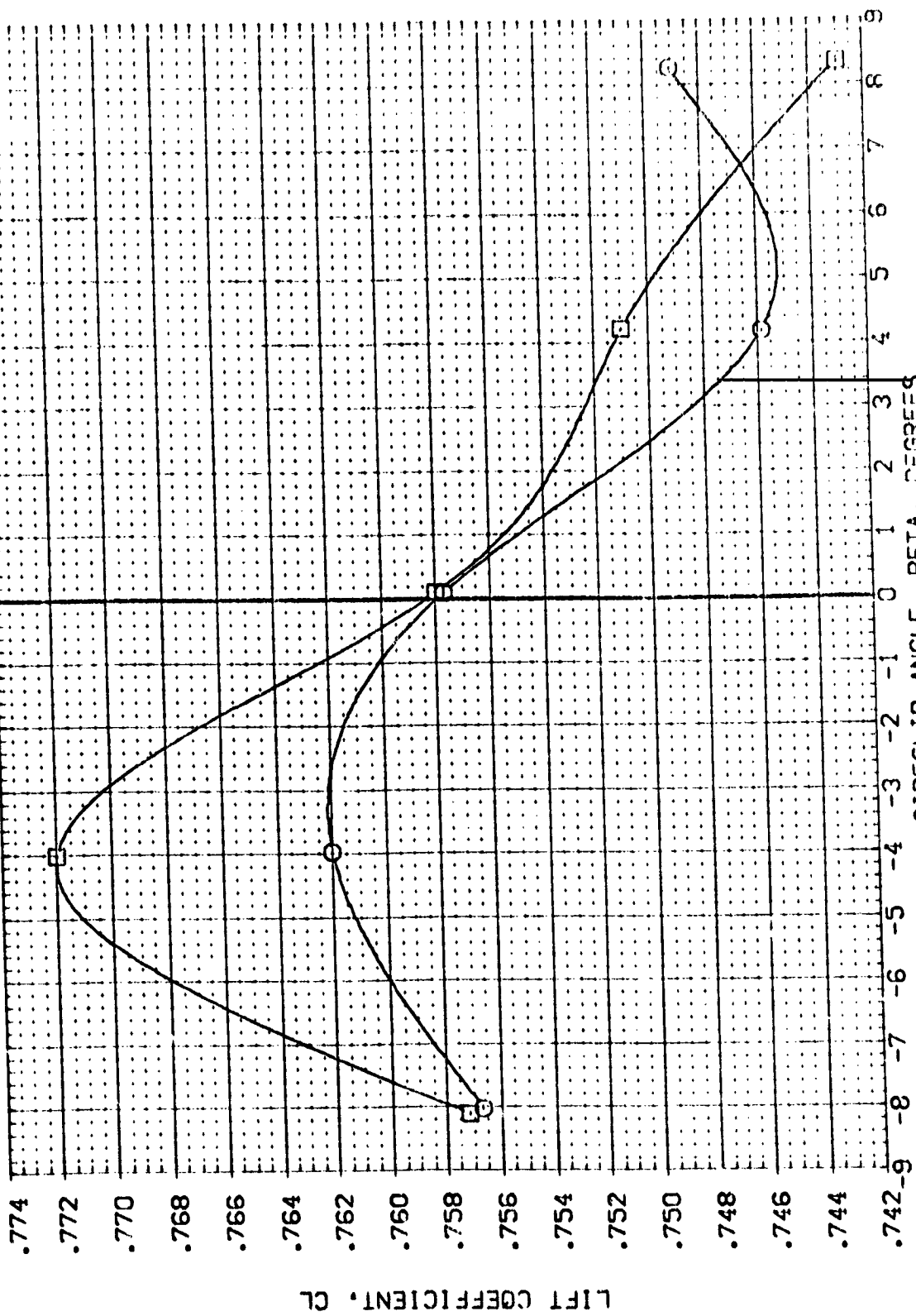


FIG.18 ORBITER LAT-OIR. DATA AT ALPHA=15 DEGS., RUDDER=-20 DEGS., YN=0.800, 0.901
 SIDESLIP ANGLE, BETA, DEGREES

(RBPO16)

AMES 11-707 OA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 □ .604 .889 20.000 -20.000 ELEVON RUDFLR
 .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8150
 BREF 39.8150
 XREF 32.0000
 WREF 1000
 TREF 1000
 SCALE 1000

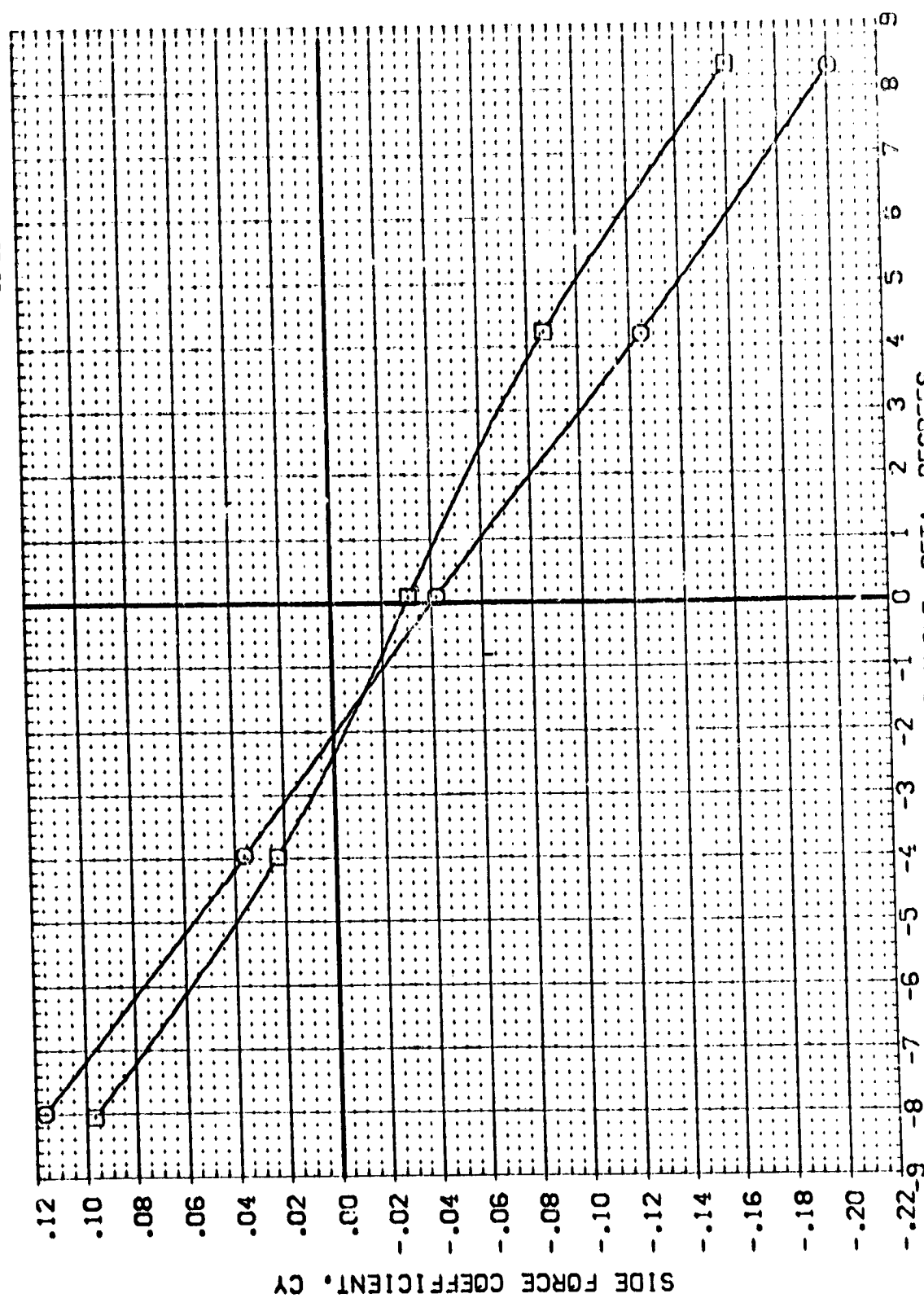


FIG.19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., $M=0.804, 0.889$
 PAGES 135

AVES 11-707 0A12 02A

SYMBOL	UNIT	PARAMETRIC VALUES
ALPHA	0.604	20,000
BETA	0.000	-20,000
ROEFLR	0.000	0.000

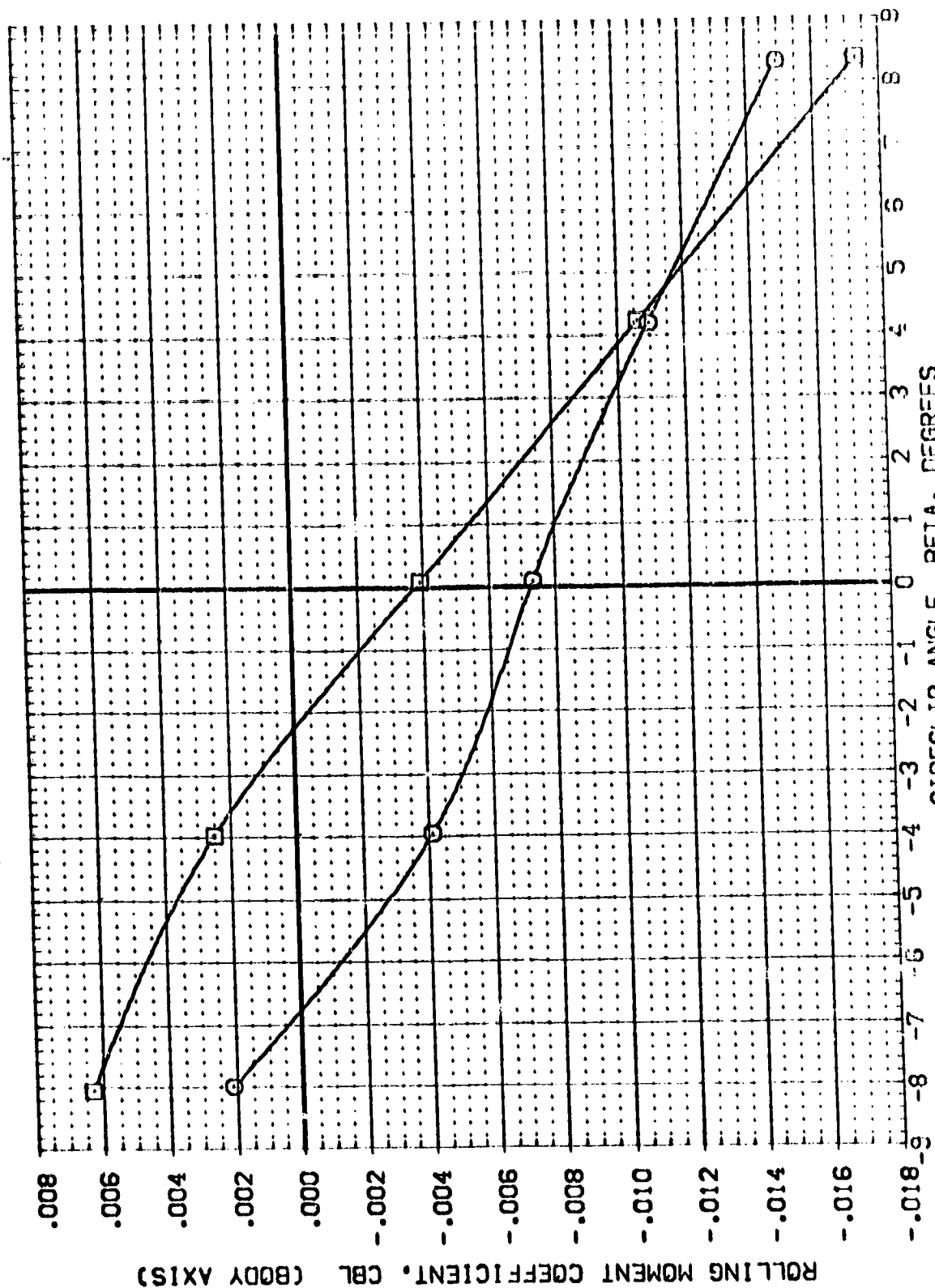
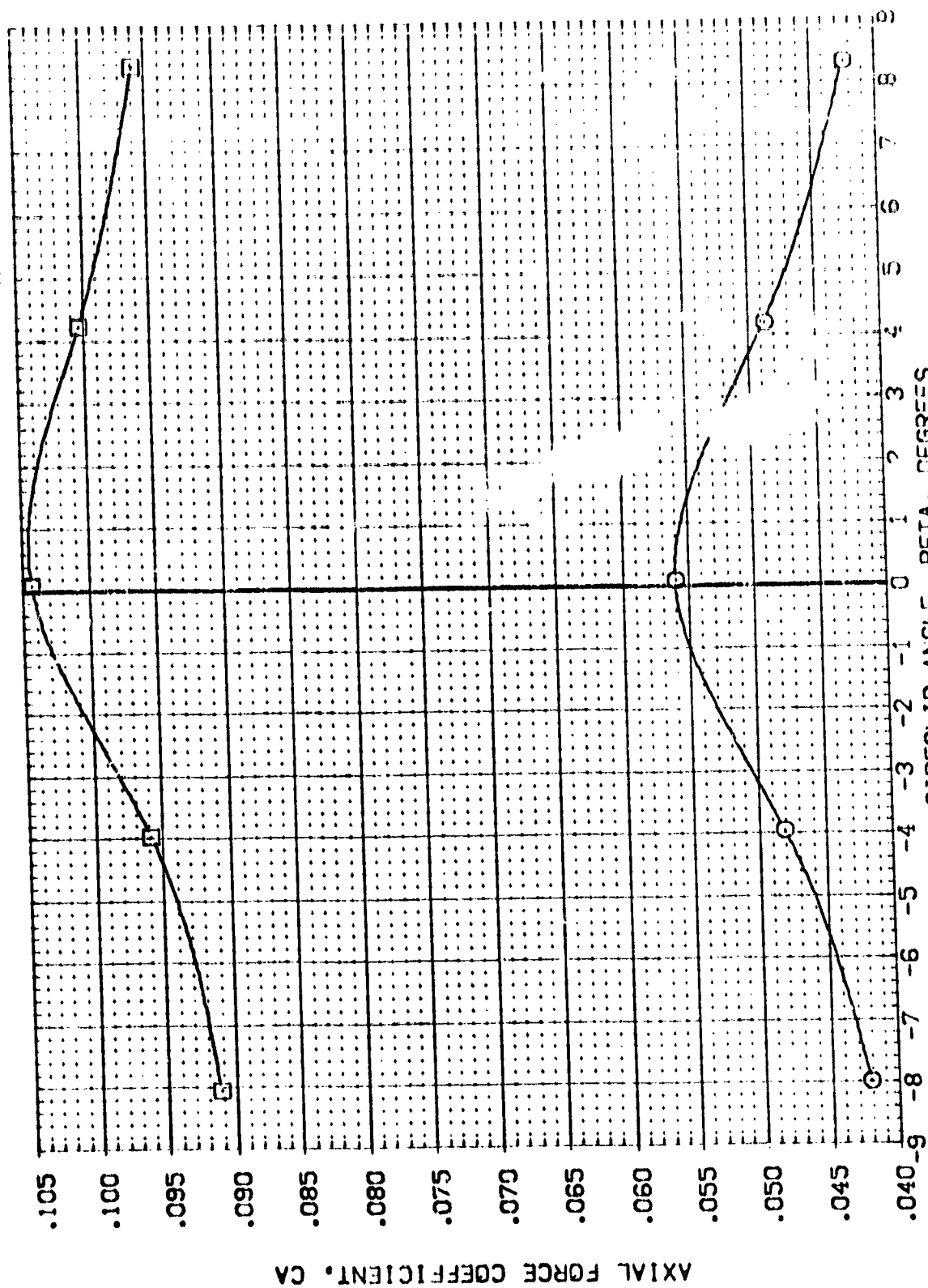
[illegible]

FIG. 19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=20 DEGS.,
SIDESLIP ANGLE, DATA AT ALPHA=20 DEGS.,
W=0.334, 0.899
D=2E
13-

AVES 11-707 CA12 G2A

SYNCH	WACH	PARAMETRIC VALUES	
()	.604	ALPHA	20.000
()	.889	RUDER	-20.000
			ELEVON
			RUDFLR

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2815 2816 2817 2818



SIDESLIP ANGLE, BEAM DEGREE

FIG. 19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., W=C. 0.7, D. 0.89
D=GE : 0.6 : 0.9



(RBPO16)

AMES 11-707 OA12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		ALPHA	ELEVON
□	.604	20.000	.000
○	.899	-20.000	.000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 39.849C
 BREF 39.849C
 XMRP 32.300C
 YMRP 0.000C
 ZMRP 0.000C
 SCALE .030C

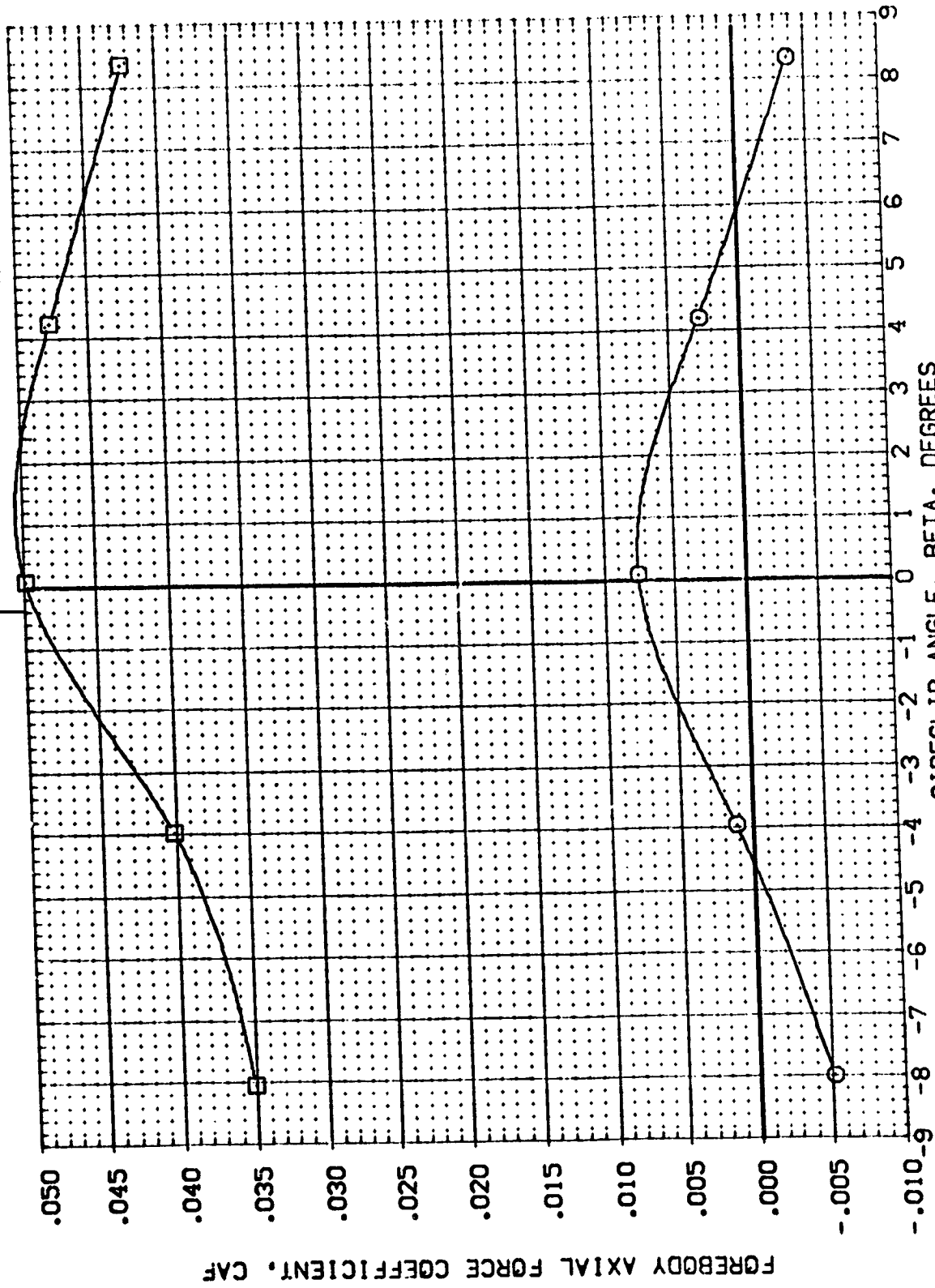


FIG.19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., MN=0.604, 0.899



(RBP016)

ES 11-707 0A12 02A

REFERENCE INFORMATION
 SREF 2.421C
 LREF 38.848C
 BREF 38.848C
 XREF 32.300C
 YREF 0.000C
 ZREF 0.000C
 SCALE 0.030C

SYMBOL MACH ALPHA RUDDER ELEVON RUDDER
 ○ .604 .899
 □ .000 .000

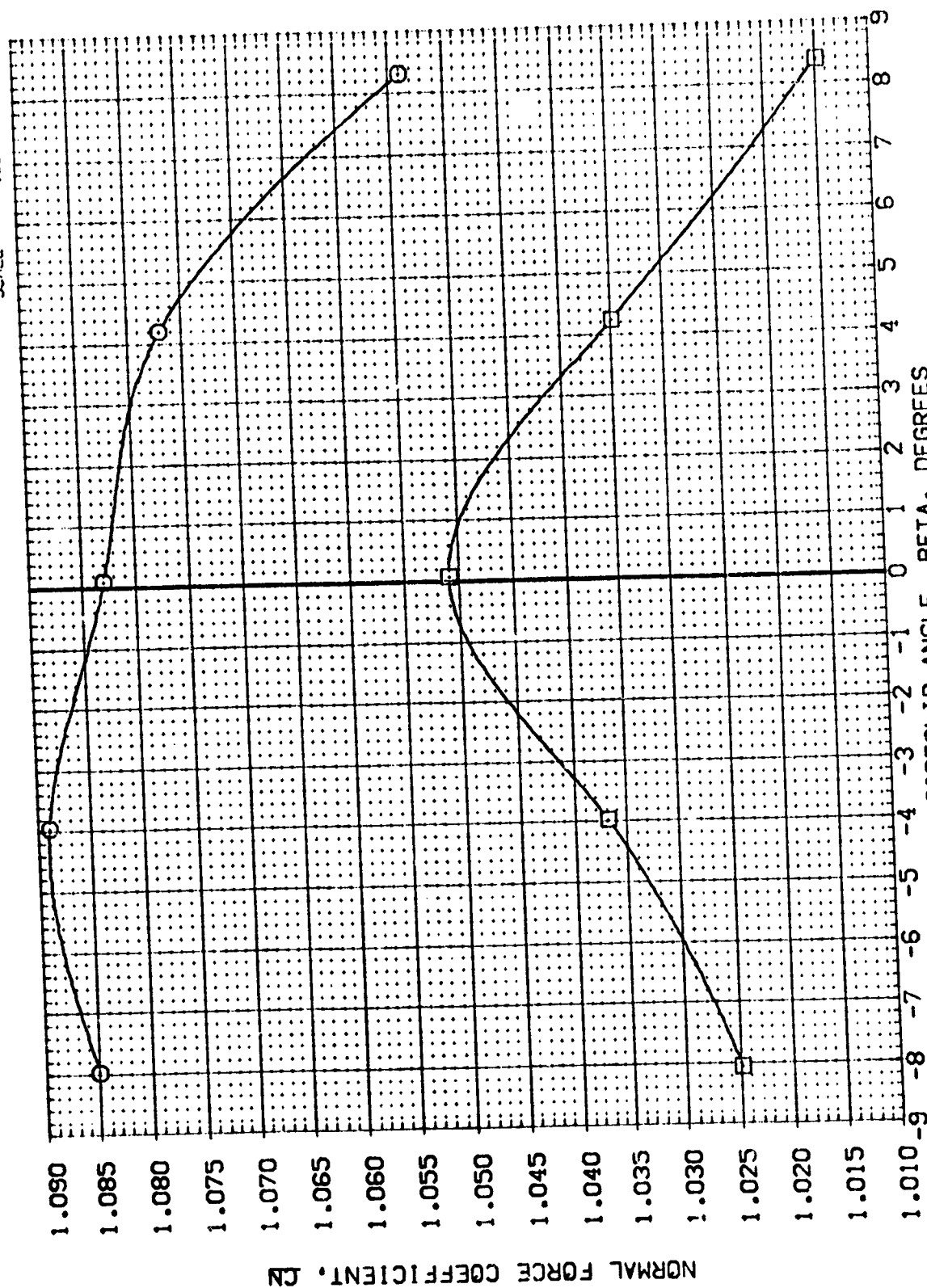


FIG.19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., MN=0.634, 0.899
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 140



(RBP0:6)

AMES 11-707 0A12 02A

SYNCH.	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	ELEVON	RUOFLR	.COO	.COO
100	.804	.899		20.000	-20.000			

REFERENCE INFORMATION
 SREF 7.4210 SQ.FT.
 I-REF 38.8400
 BREF 38.8400
 XREF 32.5000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000

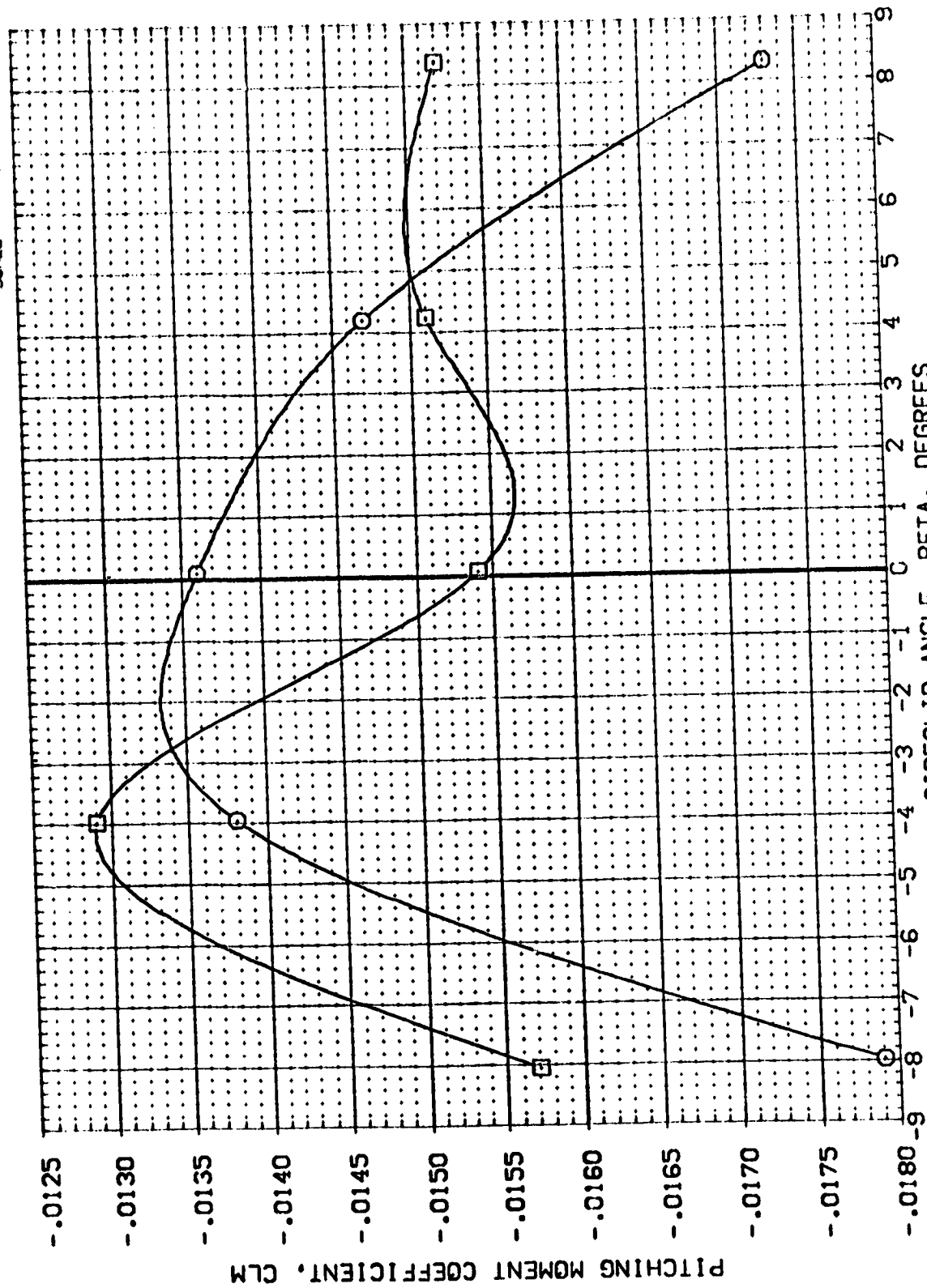


FIG.19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., MN=0.604, 0.899
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 4

AVES 11-707 0A12 02A

SYMBOL	MAX ²⁴	PARAMETRIC VALUES	
()	.604	ALPHA	20,000
	.000	B POWER	-20,000
		ROEFLR	
		ELEVON	

SREF	2 401
REF	39 689
SREF	39 689
REF	32 3
VREF	32 3
CANZ	32 3
SCALE	32 3

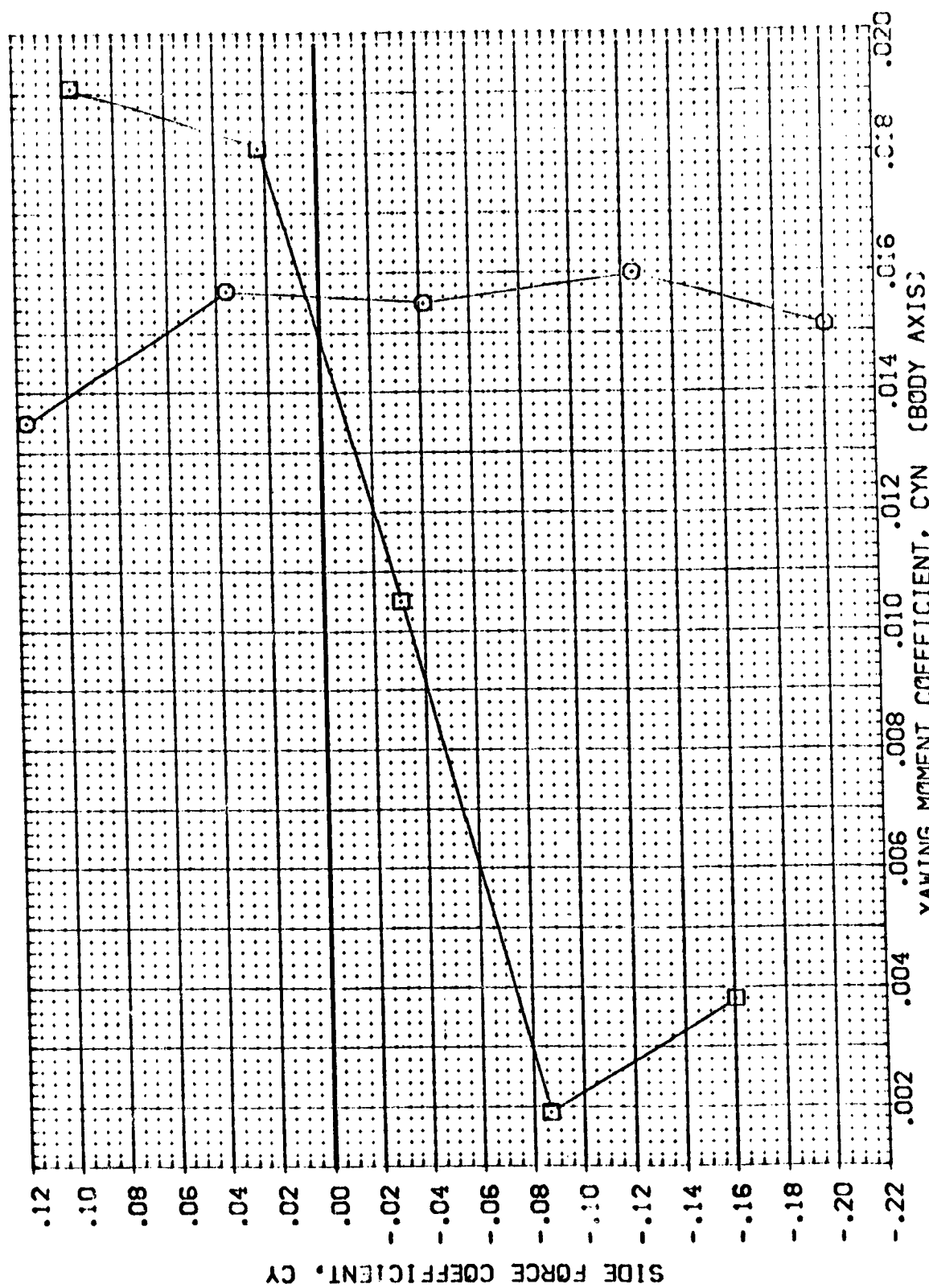


FIG. 19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., $MN=C.834$, $C.893$



(ABPC16)

AMES 11-707 UA12 02A

SYMBOL		MACH	PARAMETRIC VALUES	
○	□		ALPHA	RUDDER
		.604	20.000	ELEVON
		.899	-20.000	RJDFLR

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8480
 BREF 39.8480
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.0000

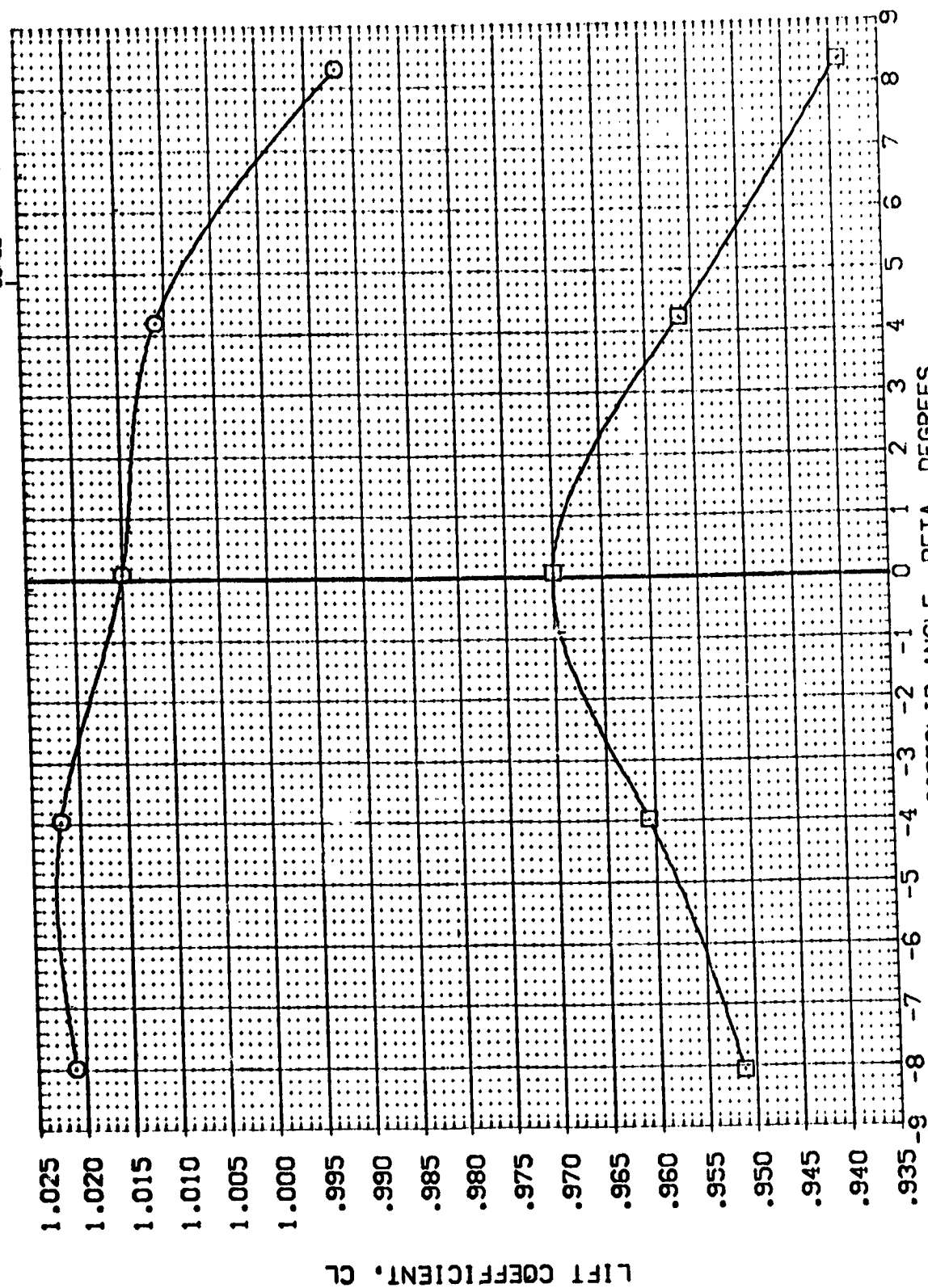


FIG.19 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDER=-20 DEGS., MN=0.604, 0.899

(RBPO:7)

AMES 11-707 CA12 02A

SYMBOL	MACH	PARAMETRIC VALUES		
		ALPHA	ELEVON	RUDFLR
□	.597	.000	.000	.000
□	.901	.000	.000	.000

REFERENCE INFORMATION:

SYMBOL	SC.F.T.
SREF	2.4210
REF	39.8490
BREF	39.8490
XMRD	32.0000
YMRD	0.0000
ZMRD	0.0000
SCALE	0.0000

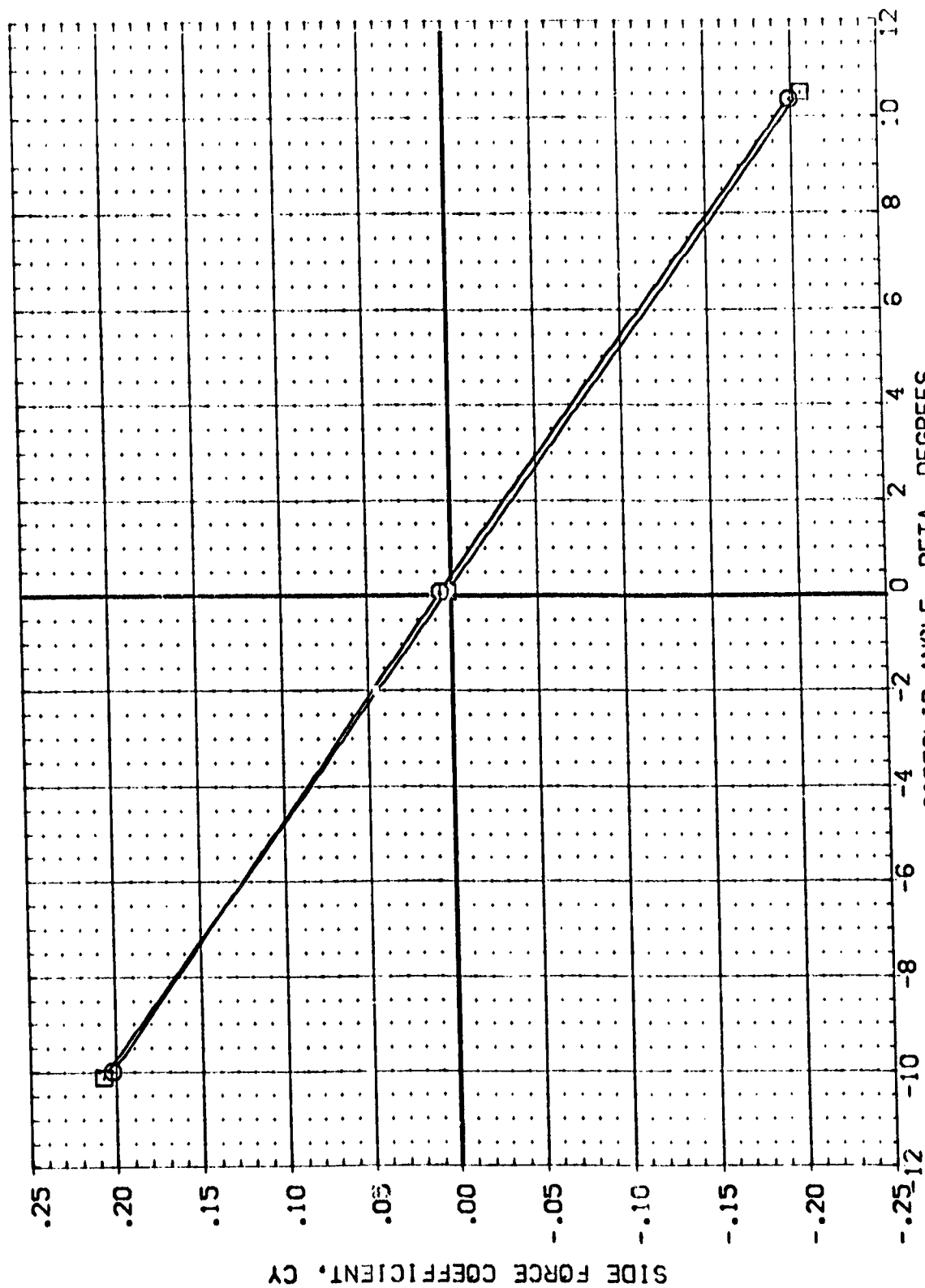


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS., MN=0.597, 0.901



(RBPC17)

AMES 11-707 CA12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	10.000
□	.597	RUDER	.000	RUDFLR	.000
□	.901				

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8450
BREF	39.8450
XPRP	32.3000
YPRP	.0000
ZPRP	.0000
SCALE	.0300

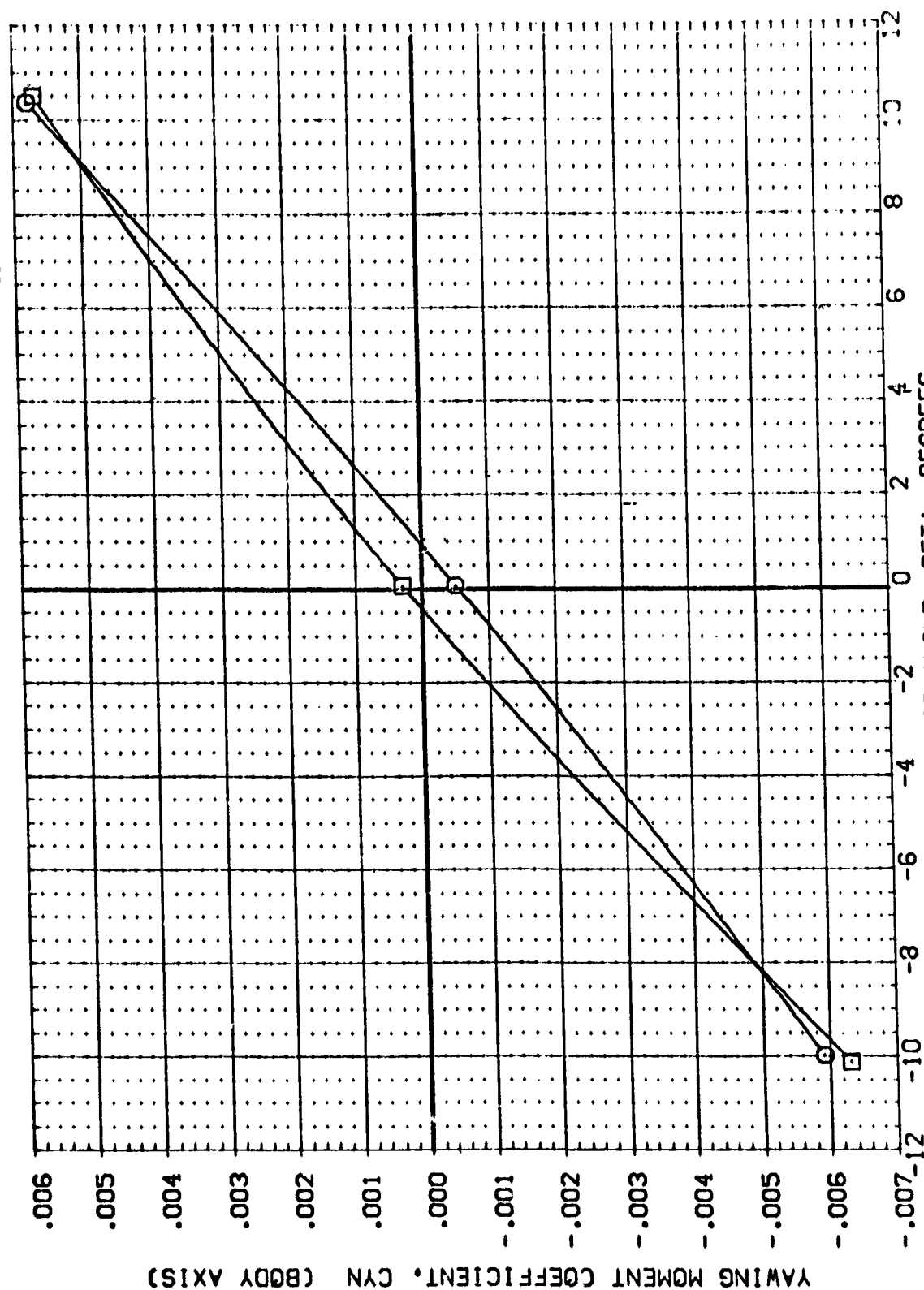


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS., MN=0.597, 0.901

AVES 11-707 3A12 02A

100

is.

ALPHA
RUBBER

```
PARAMETRIC VALUES
.0000    ELEVEN
.0000    RUJDLR
```

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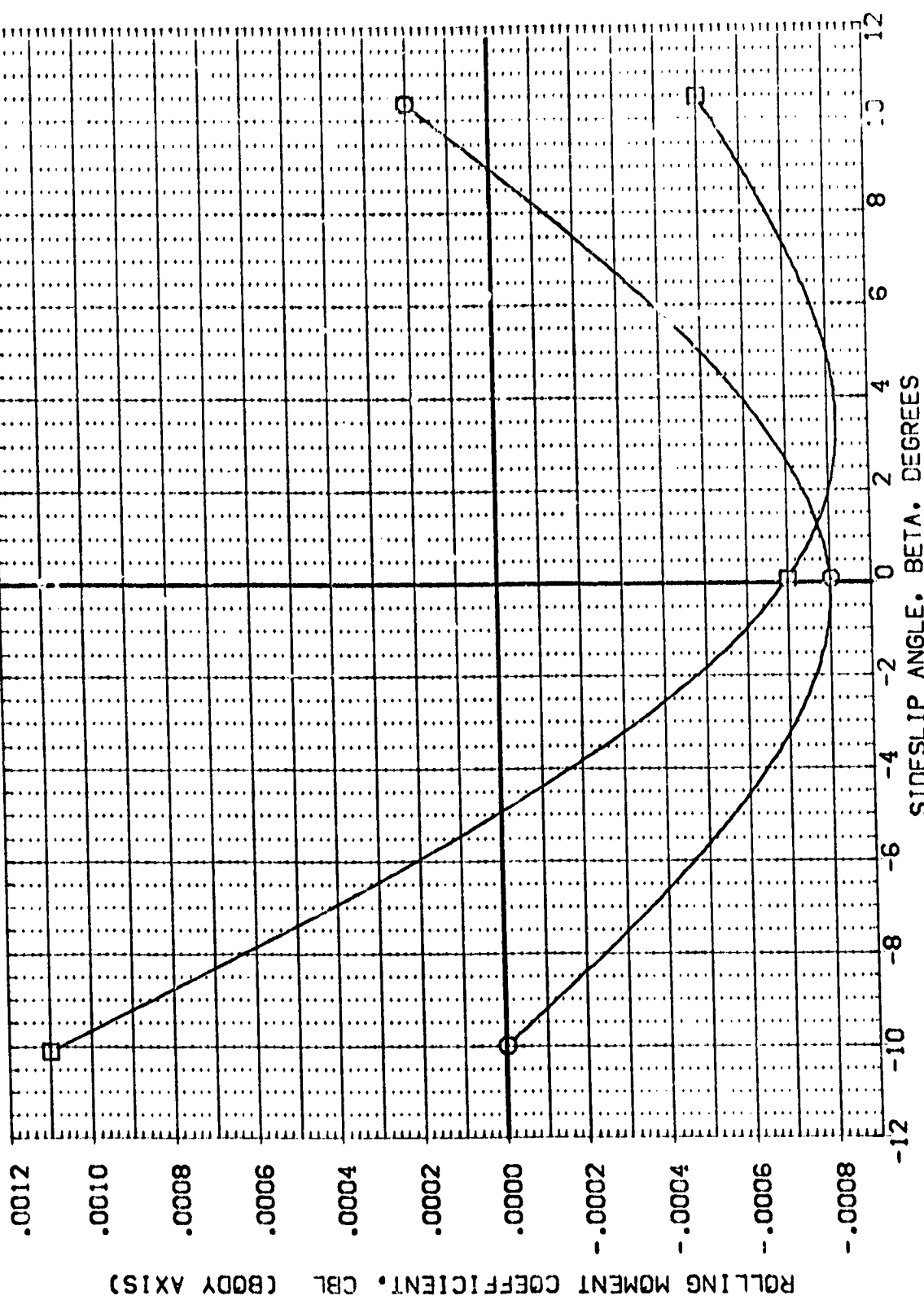
[illegible]

FIG. 20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. $\overline{MN}=0.597$. \overline{C}_{D01}

(RBP017)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 RUDFLR .000

REFERENCE INFORMATION
 XREF 2.421C
 YREF 38.841C
 ZREF 38.841C
 XGRP 32.200C
 YGRP 32.200C
 ZGRP 32.200C
 SCALE 1.000

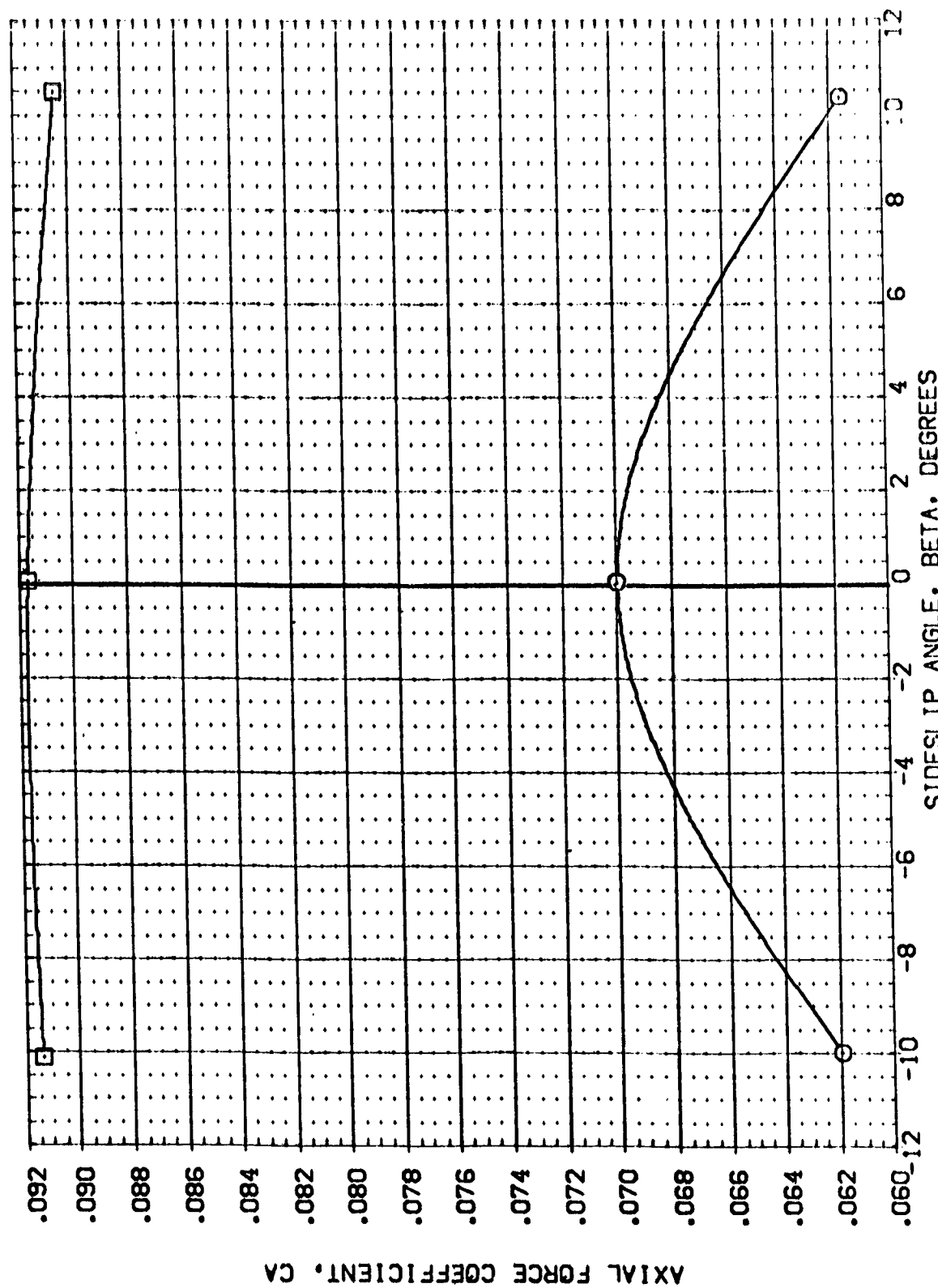


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. MN=0.597, 0.901



[R3PC017]

AMES 11-707 CA12 C2A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
 1 .597 .901 .000 .000 .000 .000

REFERENCE INFORMATION
 SREF 2.4213
 LREF 38.5160
 BREF 38.5160
 XREF 32.3333
 YREF 32.3333
 ZREF 32.3333
 SCALE 1.000

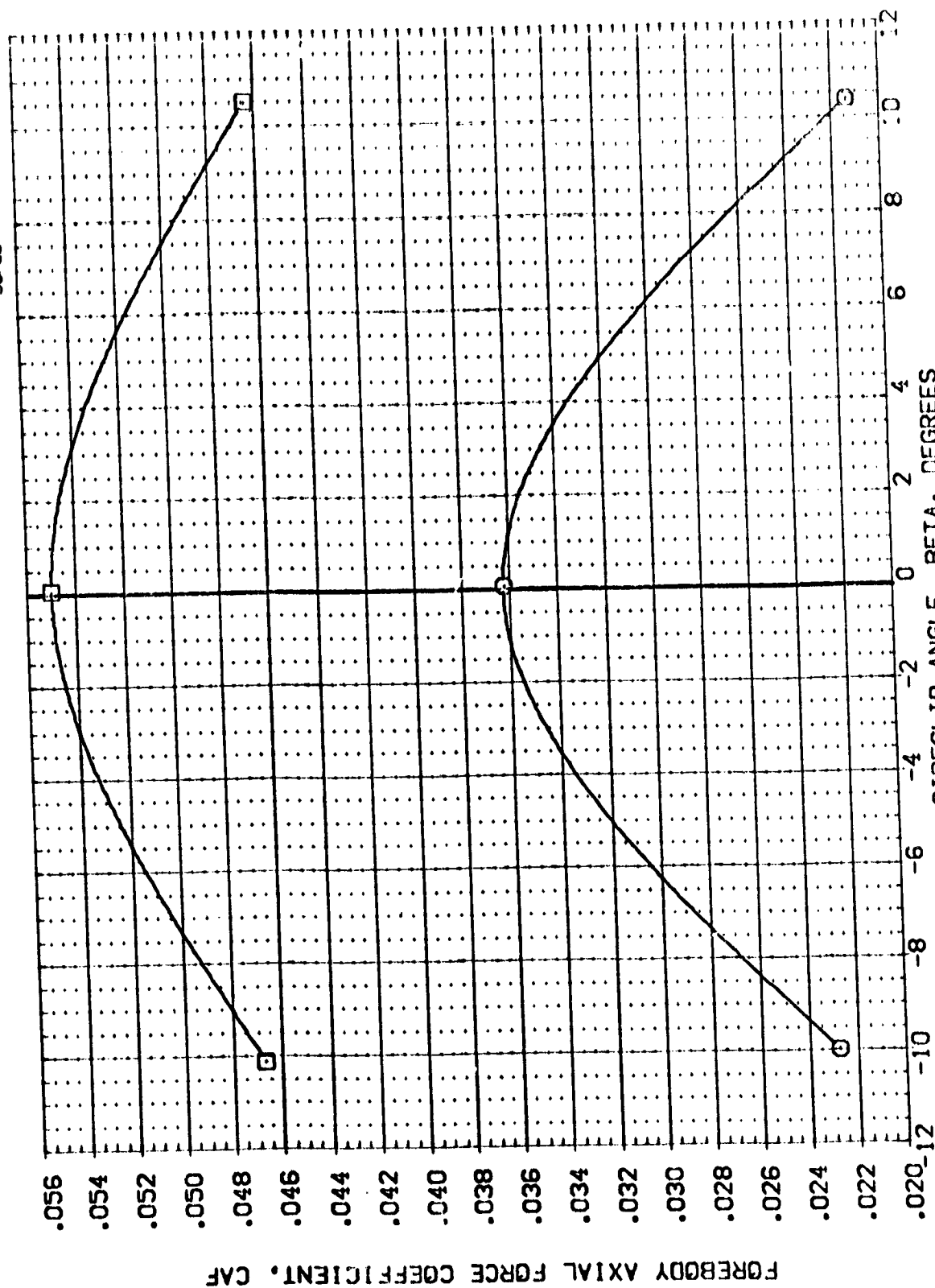


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. YN=0.597, C.901

AMES 11-707 0A12 02A

(RBP017)

110
SYNOPSIS

106.
465.
MACH

ALPHA
RJOER

PARAMETRI
 .000
 .000

10.000

1365

2.423333

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Spec	2.27.0	2.27.1	2.27.2	2.27.3	2.27.4	2.27.5	2.27.6	2.27.7	2.27.8	2.27.9	2.27.10	2.27.11	2.27.12	2.27.13	2.27.14	2.27.15	2.27.16	2.27.17	2.27.18	2.27.19	2.27.20	2.27.21	2.27.22	2.27.23	2.27.24	2.27.25	2.27.26	2.27.27	2.27.28	2.27.29	2.27.30	2.27.31	2.27.32	2.27.33	2.27.34	2.27.35	2.27.36	2.27.37	2.27.38	2.27.39	2.27.40	2.27.41	2.27.42	2.27.43	2.27.44	2.27.45	2.27.46	2.27.47	2.27.48	2.27.49	2.27.50	2.27.51	2.27.52	2.27.53	2.27.54	2.27.55	2.27.56	2.27.57	2.27.58	2.27.59	2.27.60	2.27.61	2.27.62	2.27.63	2.27.64	2.27.65	2.27.66	2.27.67	2.27.68	2.27.69	2.27.70	2.27.71	2.27.72	2.27.73	2.27.74	2.27.75	2.27.76	2.27.77	2.27.78	2.27.79	2.27.80	2.27.81	2.27.82	2.27.83	2.27.84	2.27.85	2.27.86	2.27.87	2.27.88	2.27.89	2.27.90	2.27.91	2.27.92	2.27.93	2.27.94	2.27.95	2.27.96	2.27.97	2.27.98	2.27.99	2.27.100	2.27.101	2.27.102	2.27.103	2.27.104	2.27.105	2.27.106	2.27.107	2.27.108	2.27.109	2.27.110	2.27.111	2.27.112	2.27.113	2.27.114	2.27.115	2.27.116	2.27.117	2.27.118	2.27.119	2.27.120	2.27.121	2.27.122	2.27.123	2.27.124	2.27.125	2.27.126	2.27.127	2.27.128	2.27.129	2.27.130	2.27.131	2.27.132	2.27.133	2.27.134	2.27.135	2.27.136	2.27.137	2.27.138	2.27.139	2.27.140	2.27.141	2.27.142	2.27.143	2.27.144	2.27.145	2.27.146	2.27.147	2.27.148	2.27.149	2.27.150	2.27.151	2.27.152	2.27.153	2.27.154	2.27.155	2.27.156	2.27.157	2.27.158	2.27.159	2.27.160	2.27.161	2.27.162	2.27.163	2.27.164	2.27.165	2.27.166	2.27.167	2.27.168	2.27.169	2.27.170	2.27.171	2.27.172	2.27.173	2.27.174	2.27.175	2.27.176	2.27.177	2.27.178	2.27.179	2.27.180	2.27.181	2.27.182	2.27.183	2.27.184	2.27.185	2.27.186	2.27.187	2.27.188	2.27.189	2.27.190	2.27.191	2.27.192	2.27.193	2.27.194	2.27.195	2.27.196	2.27.197	2.27.198	2.27.199	2.27.200	2.27.201	2.27.202	2.27.203	2.27.204	2.27.205	2.27.206	2.27.207	2.27.208	2.27.209	2.27.210	2.27.211	2.27.212	2.27.213	2.27.214	2.27.215	2.27.216	2.27.217	2.27.218	2.27.219	2.27.220	2.27.221	2.27.222	2.27.223	2.27.224	2.27.225	2.27.226	2.27.227	2.27.228	2.27.229	2.27.230	2.27.231	2.27.232	2.27.233	2.27.234	2.27.235	2.27.236	2.27.237	2.27.238	2.27.239	2.27.240	2.27.241	2.27.242	2.27.243	2.27.244	2.27.245	2.27.246	2.27.247	2.27.248	2.27.249	2.27.250	2.27.251	2.27.252	2.27.253	2.27.254	2.27.255	2.27.256	2.27.257	2.27.258	2.27.259	2.27.260	2.27.261	2.27.262	2.27.263	2.27.264	2.27.265	2.27.266	2.27.267	2.27.268	2.27.269	2.27.270	2.27.271	2.27.272	2.27.273	2.27.274	2.27.275	2.27.276	2.27.277	2.27.278	2.27.279	2.27.280	2.27.281	2.27.282	2.27.283	2.27.284	2.27.285	2.27.286	2.27.287	2.27.288	2.27.289	2.27.290	2.27.291	2.27.292	2.27.293	2.27.294	2.27.295	2.27.296	2.27.297	2.27.298
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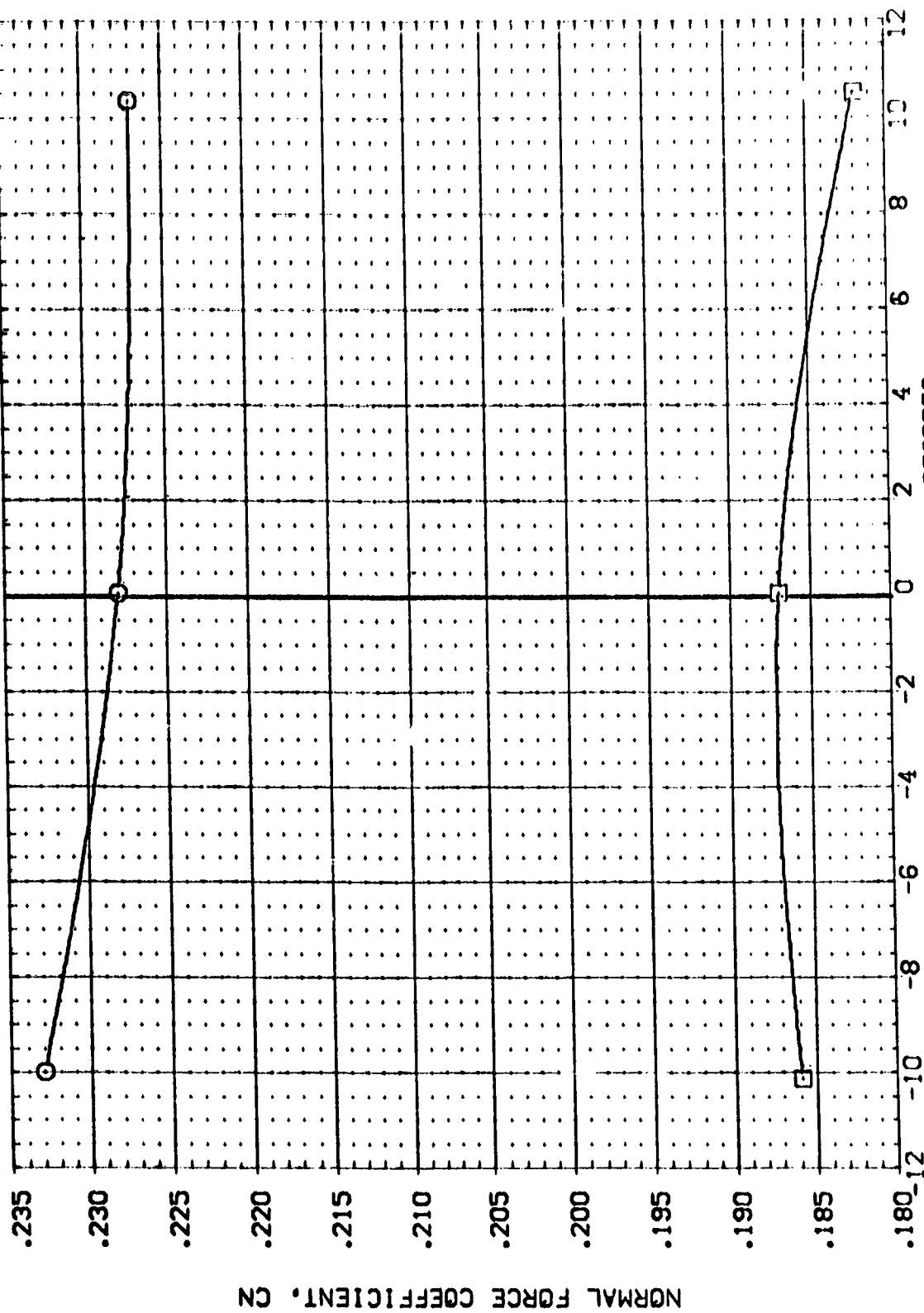
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SIDESLIP ANGLE. BETA. DEGREES

FIG. 20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. $\Delta X=0.597, 0.901$

AMES 11-707 0A12 02A

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R. W. R.

PARAMETRIC VALUES	
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RUEDEL	.000

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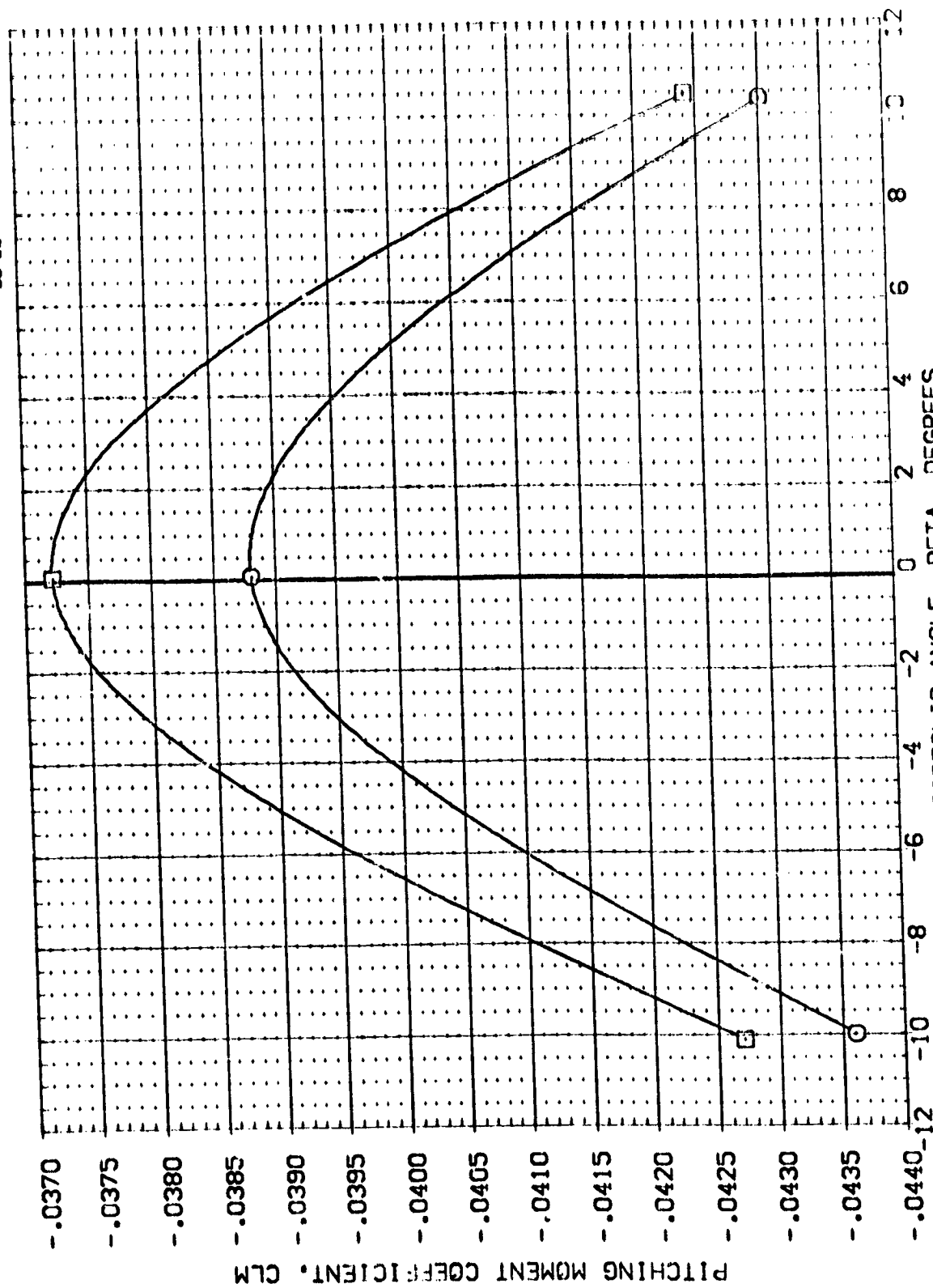


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. $M=0.597$, $C=0.901$

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•
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(R8P017)

AMES 11-707 CA12 02A

SYMBOL MACH ALPHA RUDER .C00 ELEVON .000 RUDFLR .000

REFERENCE INFORMATION
SREF 2.4212
LREF 38.655
BREF 38.655
XREF 32
YREF 100
ZREF 100
SCALE 100

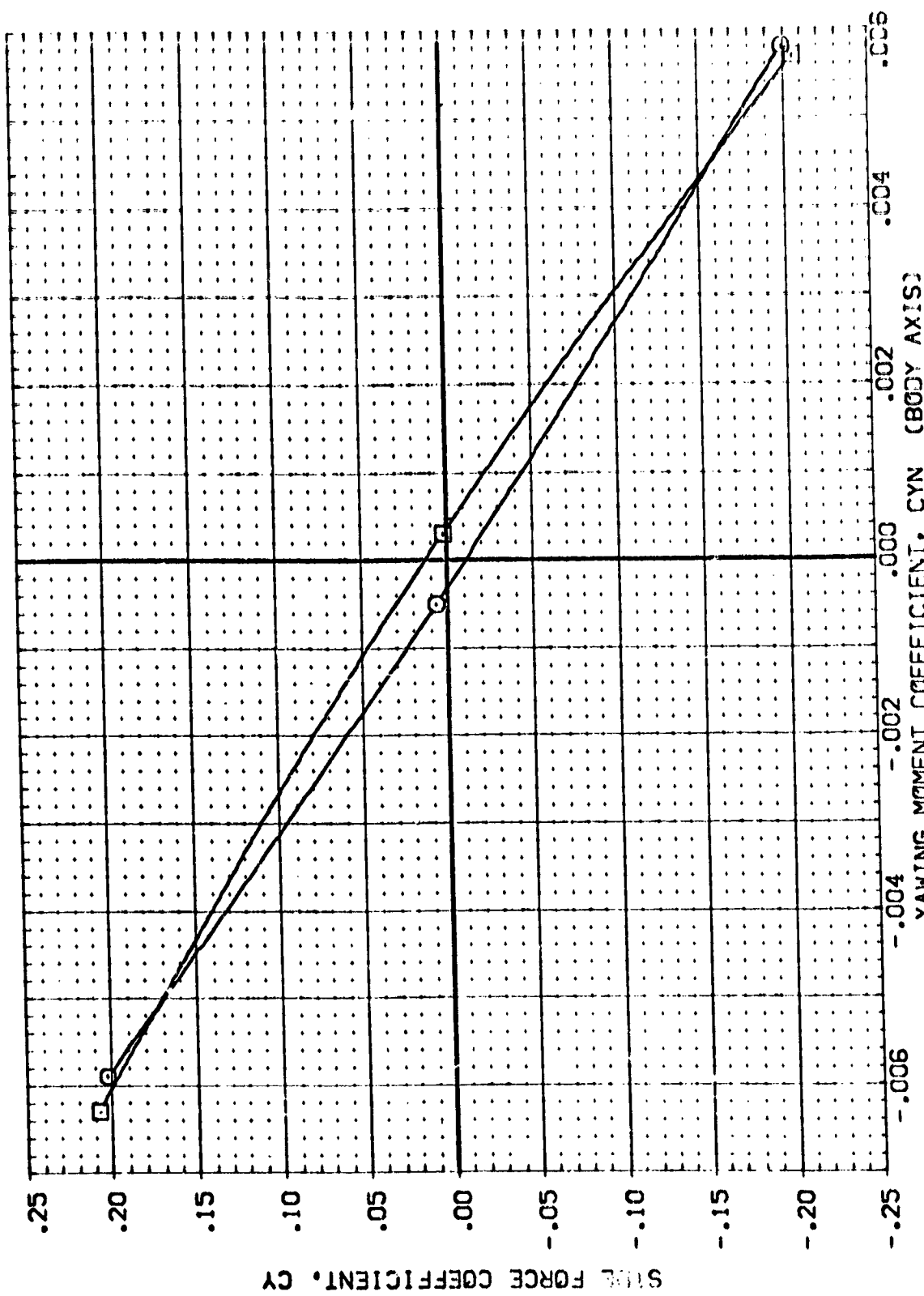


FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. YAW=0.597, 0.901
PAGE 151

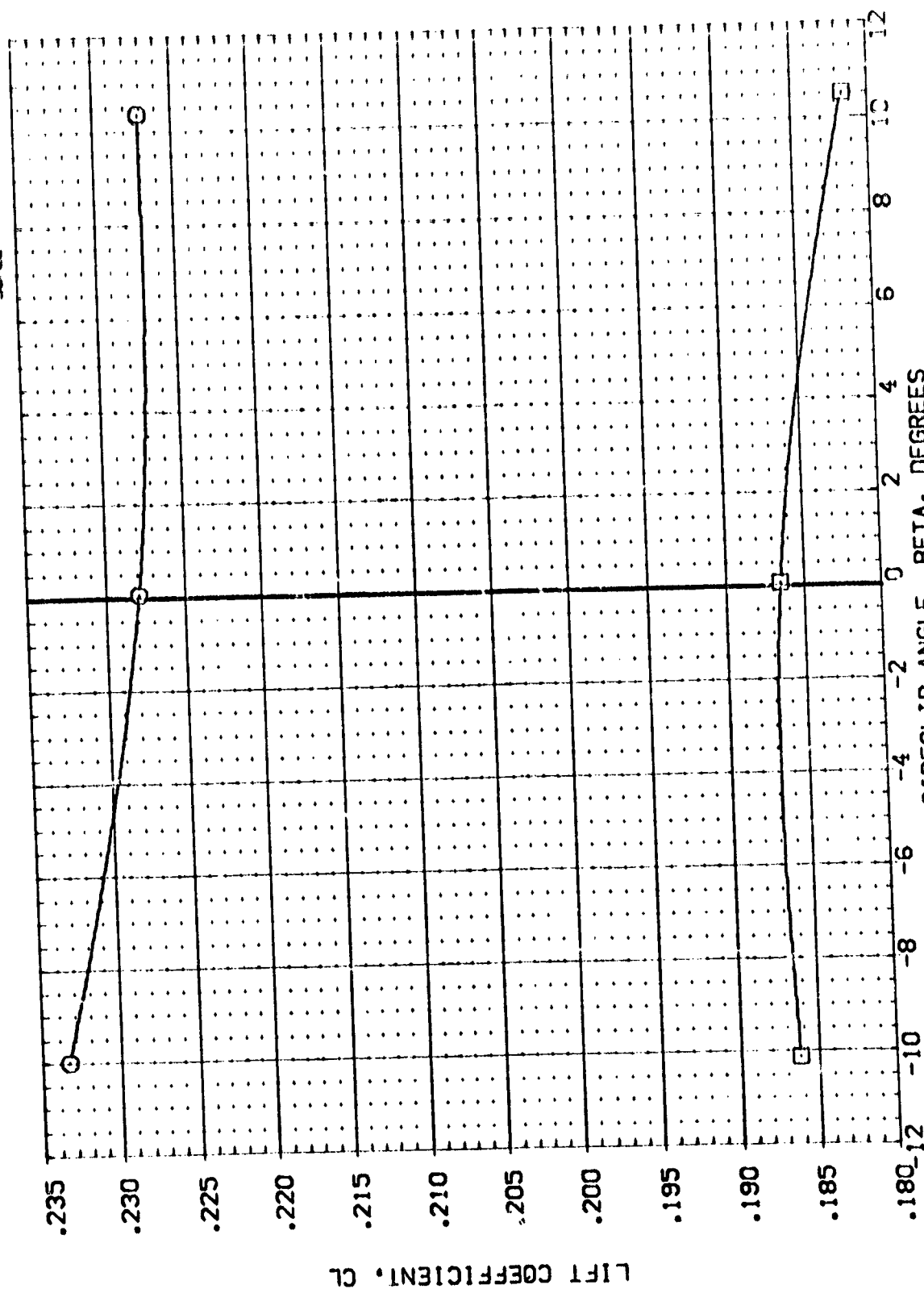
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WAG-507
ALPHA RUBBER

PARAMETRIC VALUES	
.000	ELEVON
.000	PADELP
10.000	
.000	

[illegible]

18Q_12 -10 -8 -6 -4 -2 0
SIDESLIP ANGLE. BETA. DEGREES
FIG.20 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS. ELEVON=10 DEGS. $\Delta N=0.597, 0.901$
PAGE 151

(RBP018)

AMES 11-707 0A12 02A

SYSC- WACH- .598 ALPHA .000 ELEVON 10.000
100 .895 RUDDER .000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
REF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

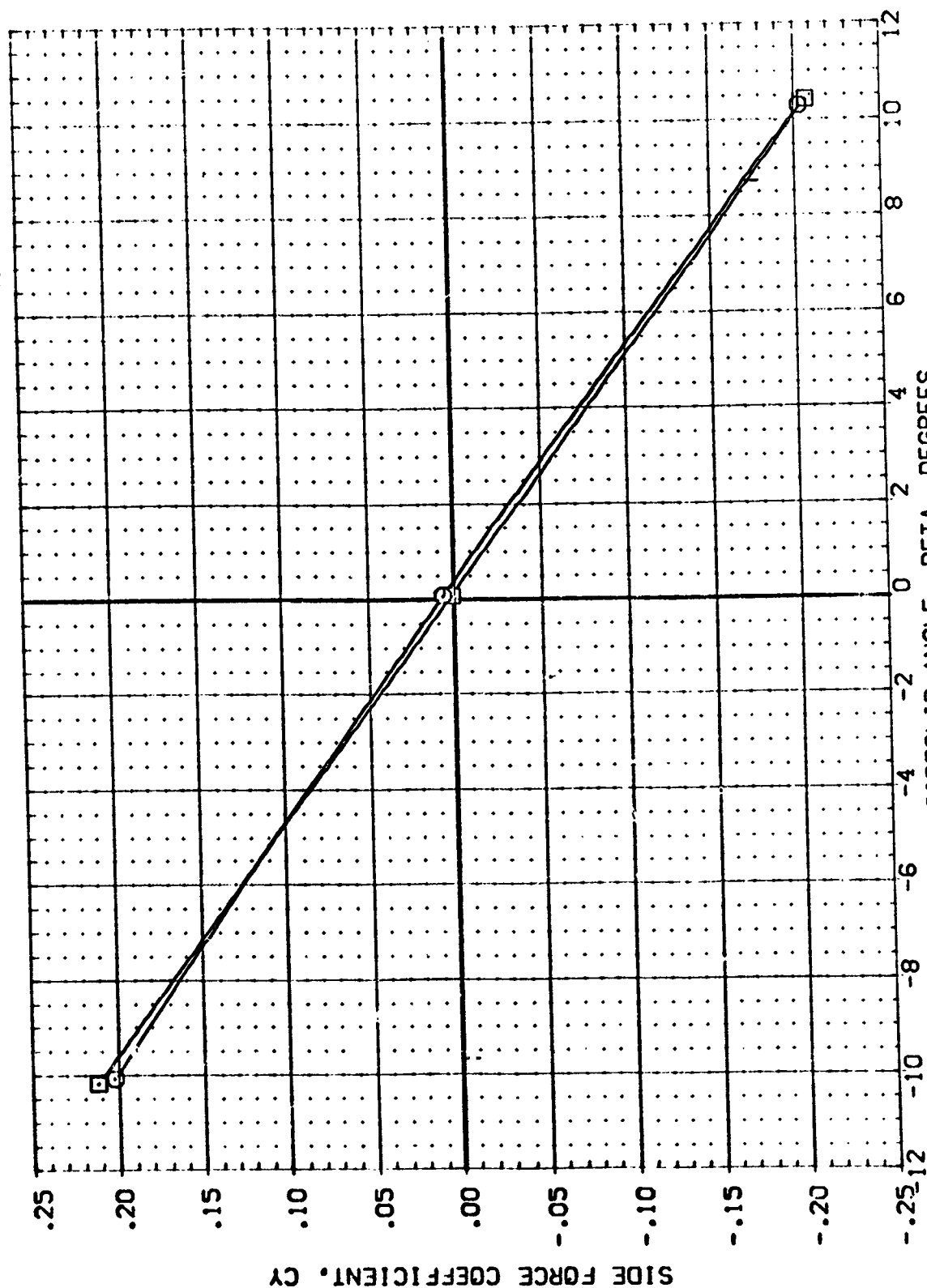


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS. MN=0.598, 0.895

(RBPO18)

AVES 11-707 GA12 32A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDFLR 10.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

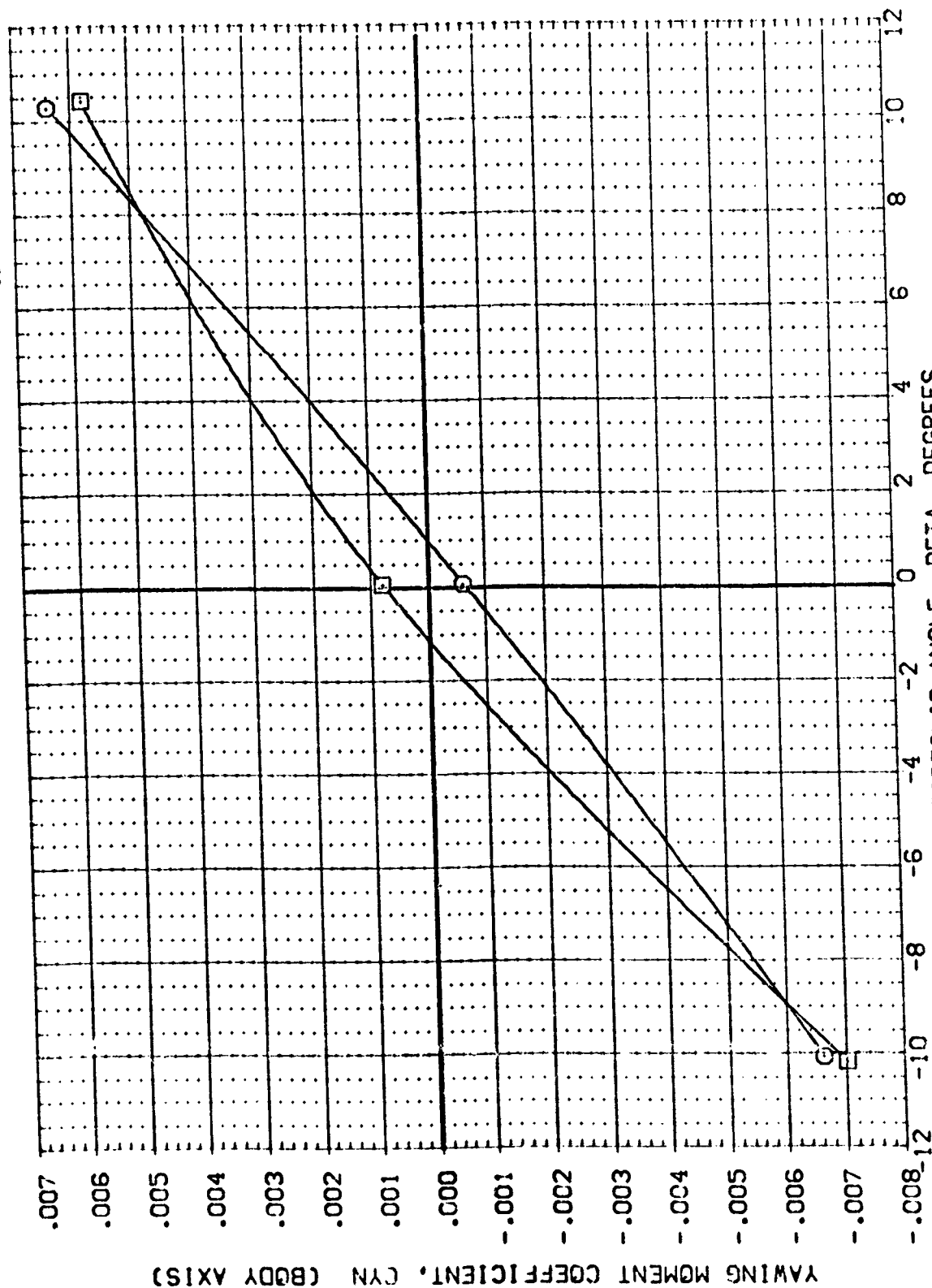


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598,0.895



(RBPO18)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3200
YMRP .0000
ZMRP .0000
SCALE .0300

SYMBOL MACH ALPHA ELEVON RUDDER
□ .598 .895
□ .000 .000

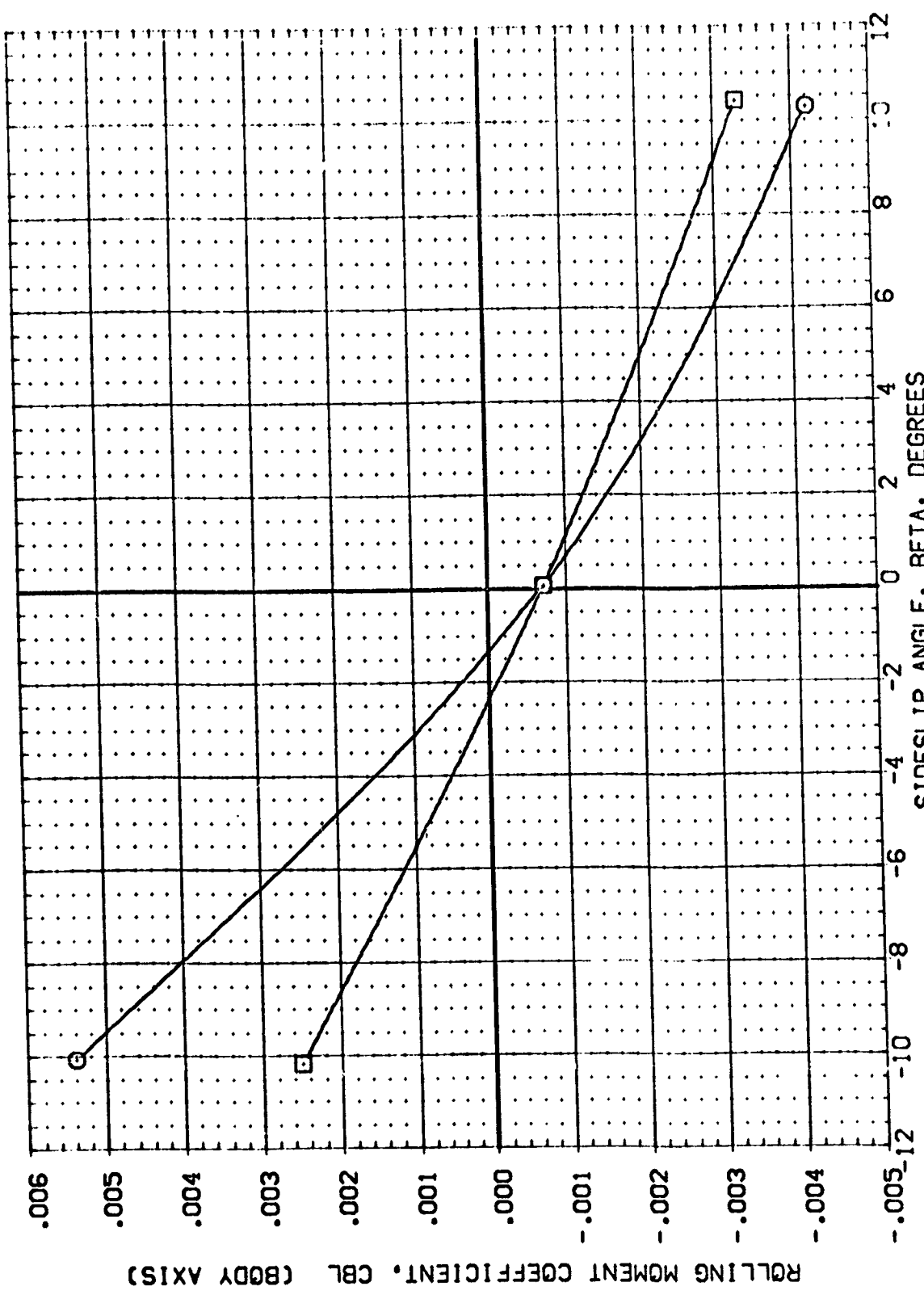


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598, C.895
PAGE :55

(RBP018)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 .598 .895
 PARAMETRIC VALUES
 5.000 10.000
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 ELEVON RUDELR

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8480
 BREF 39.8480
 XVRP 32.3000
 YVRP 0.0000
 ZVRP 0.0000
 SCALE .0300

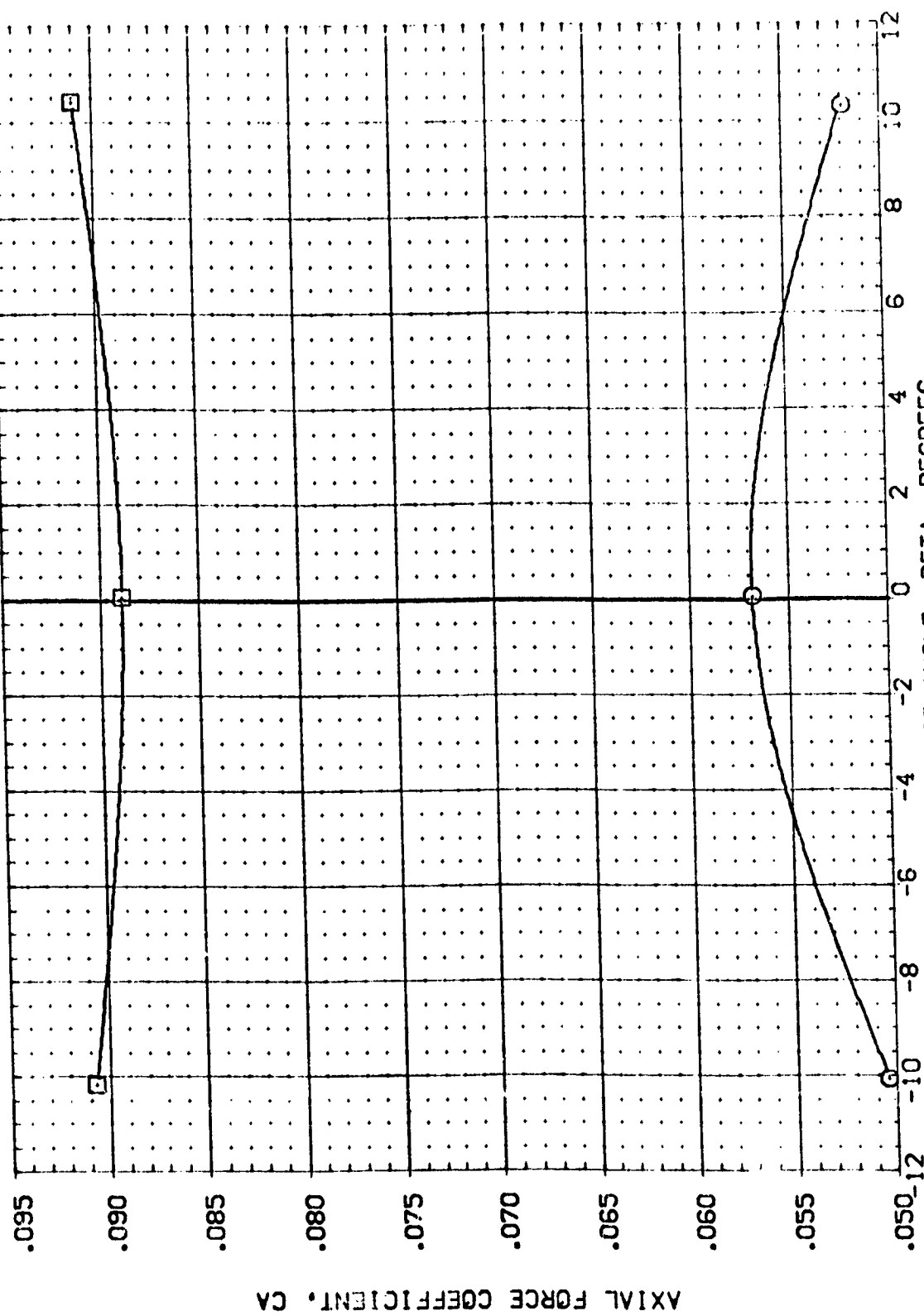


FIG.21 ORRITER LAT-Dir. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS. MN=0.598, 0.895
 PAGES 158

AMES 11-707 0A12 02A

(RBP018)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	10.000
<input type="checkbox"/>	.598	RUDLER	5.000	ELEVON
<input type="checkbox"/>	.895		.000	RUDFLR

REFERENCE INFORMATION	
SREF	2.4210
LREF	35.8450
BREF	35.8450
XMRP	32.3000
YMRP	0.0000
ZMRP	0.0000
SCALE	0.0300

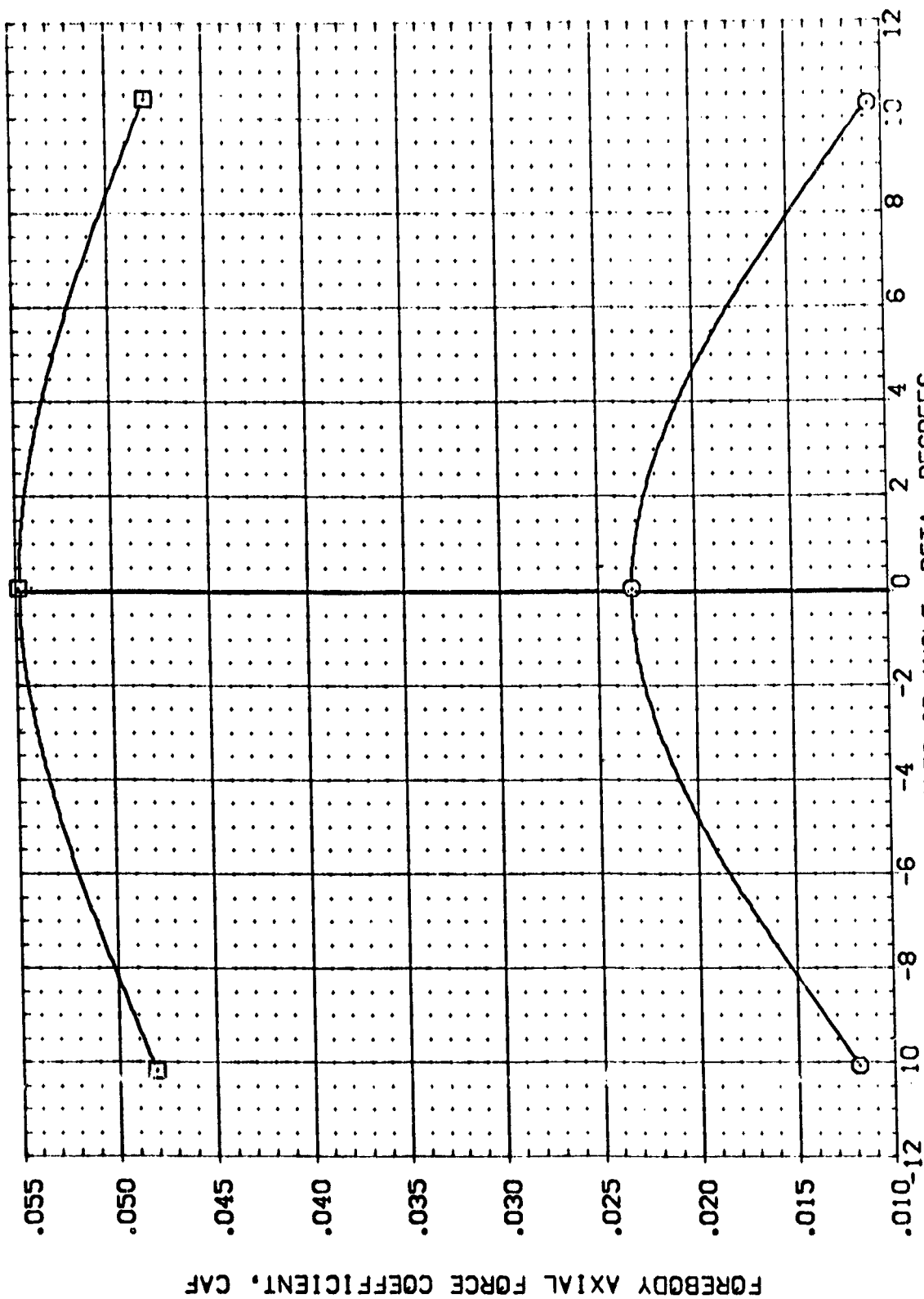


FIG.21 JRBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598, C.895

(RBPO18)

AVES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .598
□ .895

PARAMETRIC VALUES
5.000 ELEVON
.000 RUDDLR

10.000
.000

REFERENCE INFORMATION
SREF 2.4210
REF 38.8460
BRF 38.8460
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 1.000

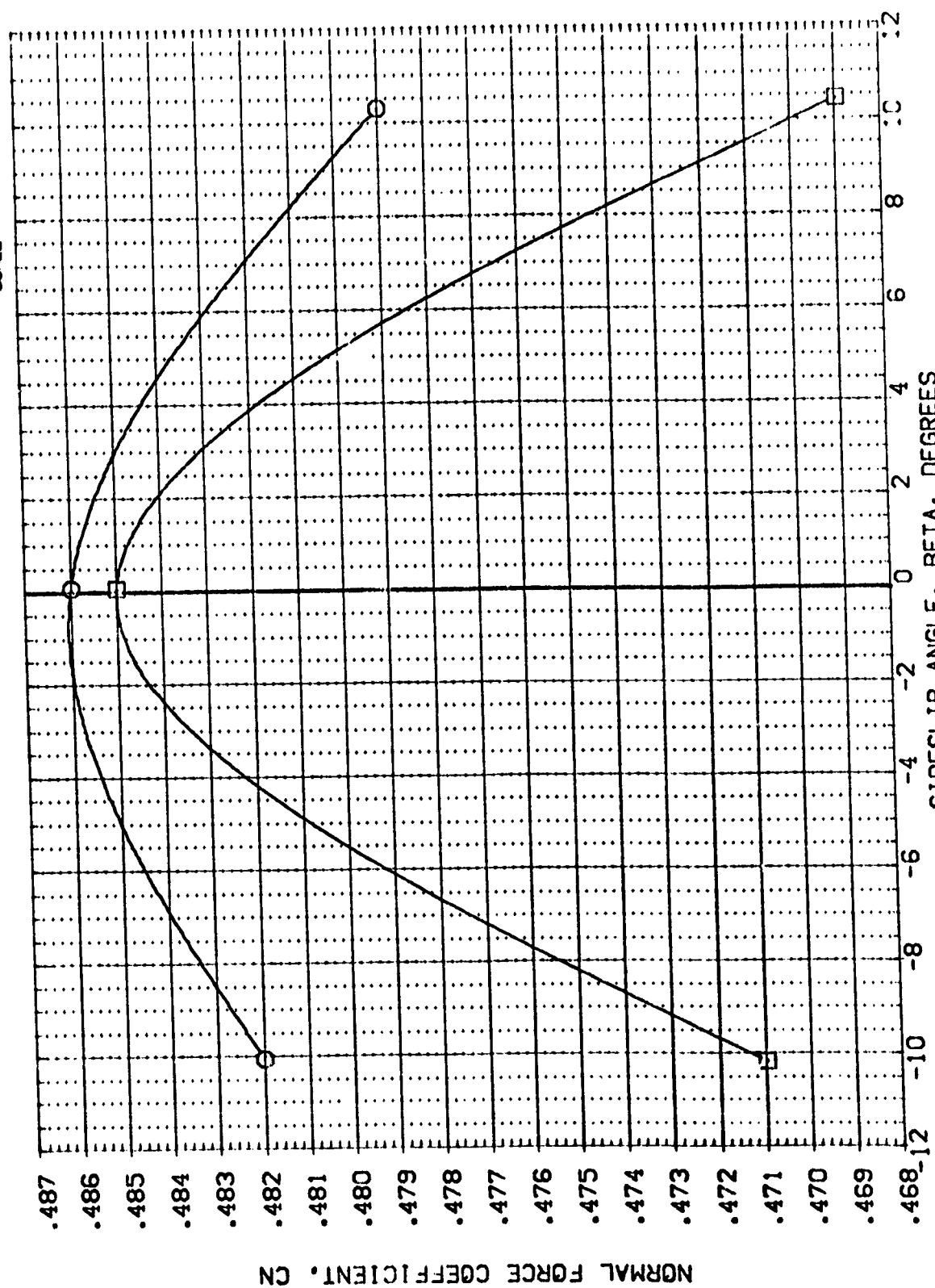


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598, 0.895
PAGE 158



AMES 11-707 0A12 02A

(RBP018)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	10.000
○	.598	RUDER	5.000	ELEVON
□	.895		.000	RUDFLR

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8450
BREF	39.8450
XMRP	32.3000
YMRP	.0000
ZMRP	.0000
SCALE	.0300

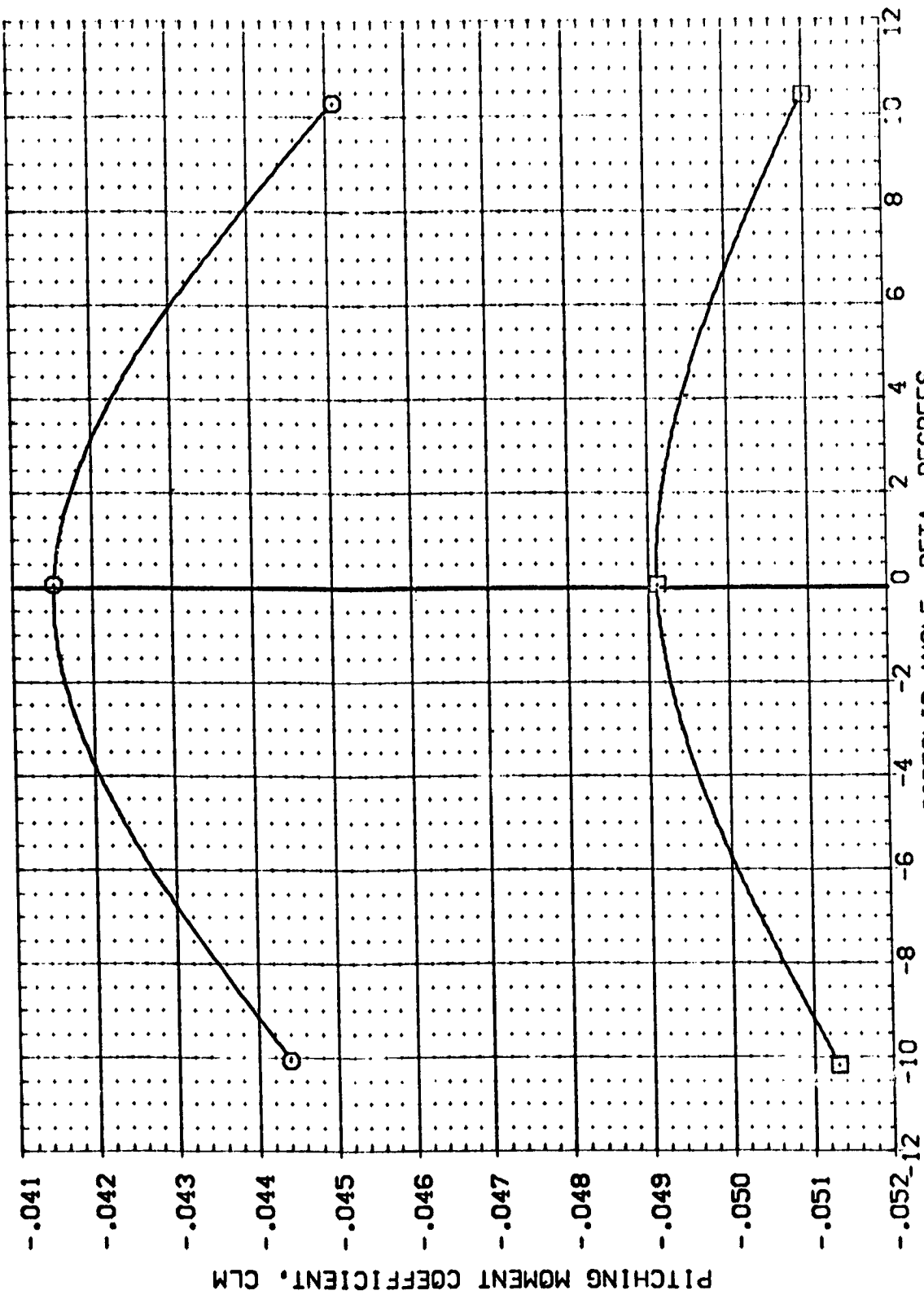


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598, 0.895

(RBPC:18)

AMES 11-707 0A12 02A

SYMBOL	WACH	ALPHA	PARAMETRIC VALUES	ELEVON	10.000
10	.598	.895	5.000	RJDFLR	.000
			.000		

REFERENCE INFORMATION	
SREF	2.4210
REF	38.8450
REF	38.8450
XREF	32.3000
YREF	0.0000
SCALE	1000

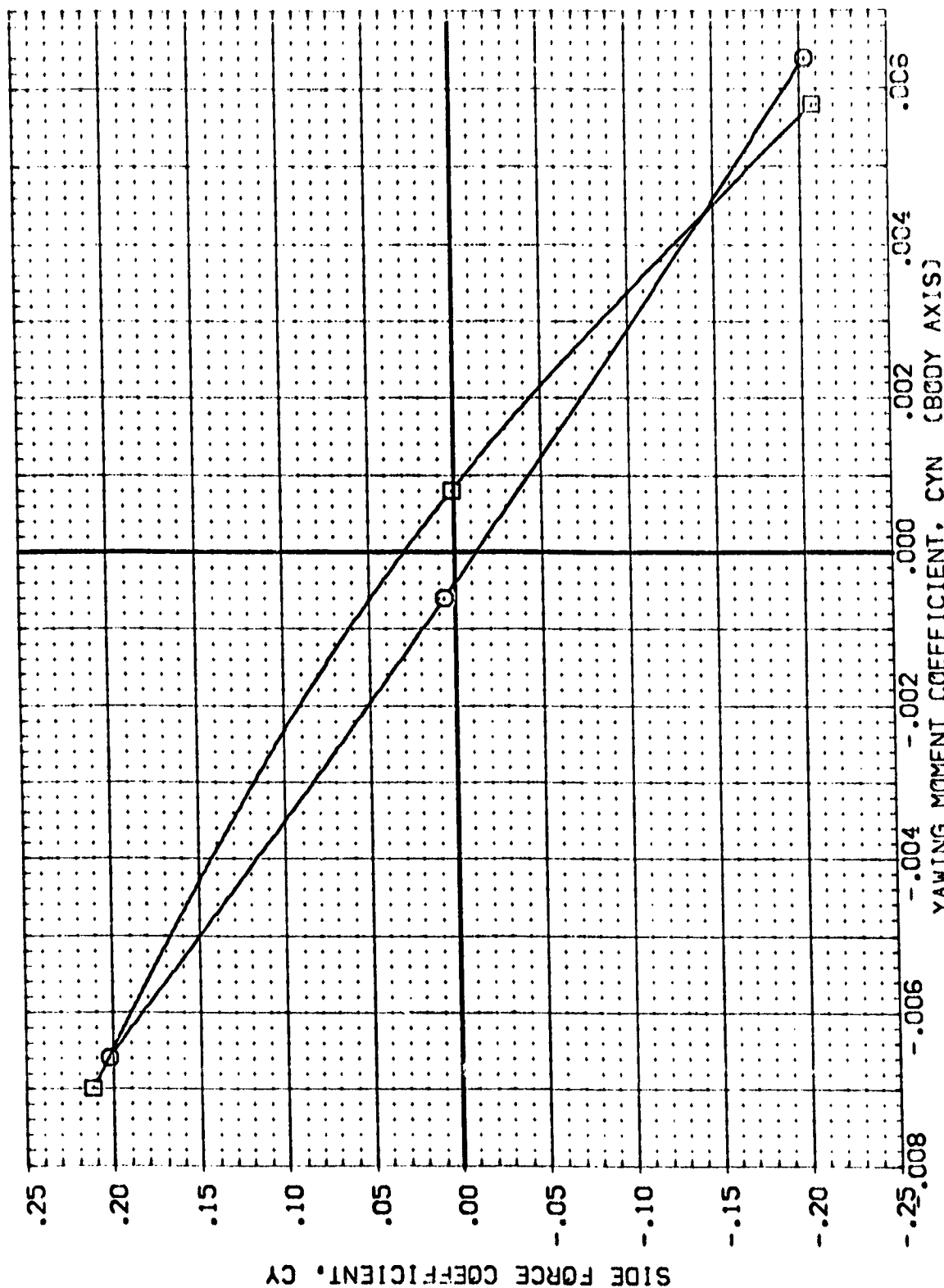


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS. $MN=0.598, 0.895$

DATE 1960



AVES 11-707 0A12 02A

(ABP018)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUJFLR 10.000 .000

REFERENCE INFORMATION
 XREF 2.4210
 YREF 39.8450
 ZREF 39.8450
 XPROP 32.3
 YPROP 32.3
 ZPROP 32.3
 SCALE 10000

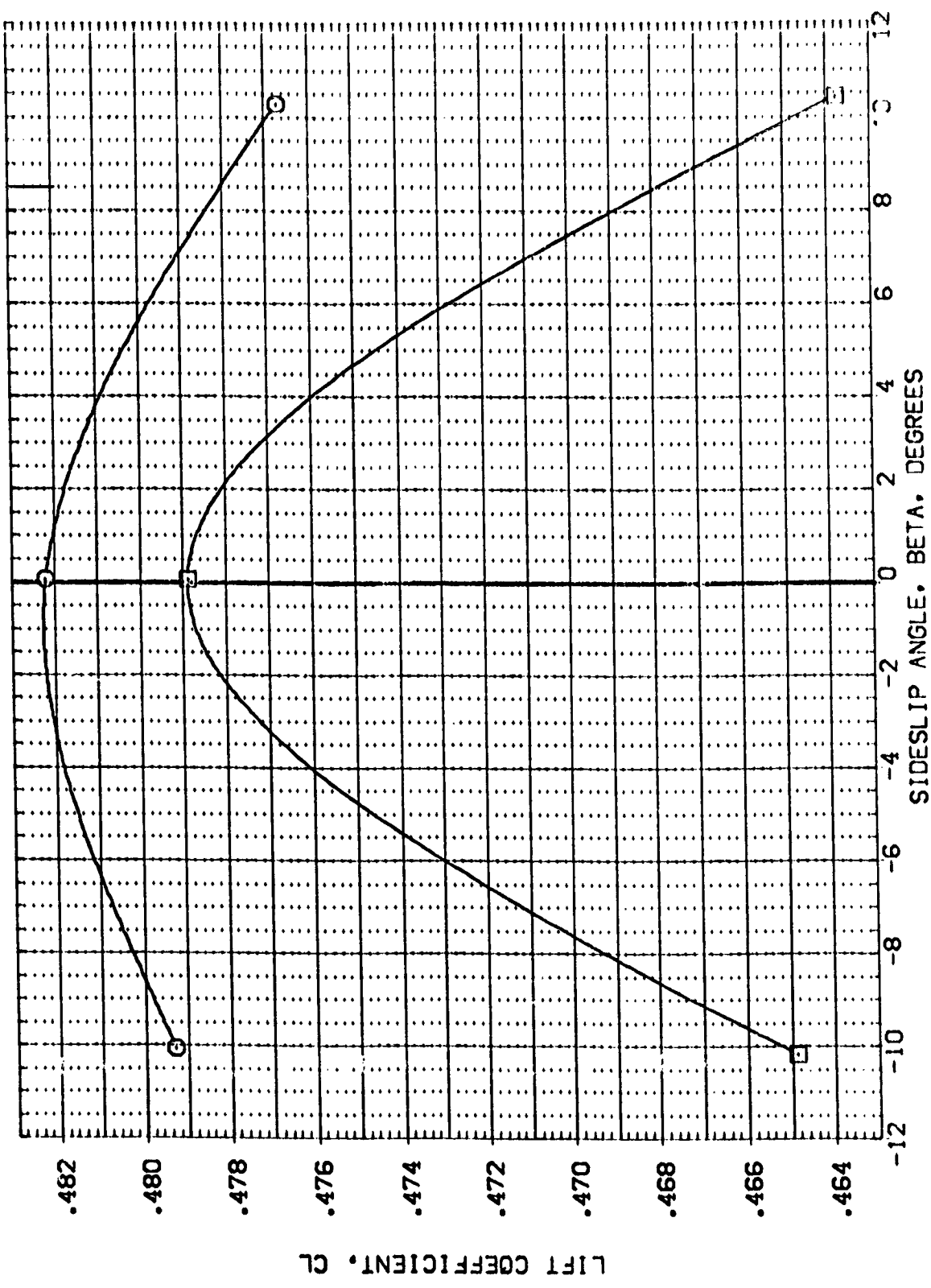


FIG.21 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS. ELEVON=10 DEGS., MN=0.598, 0.895

AMES 11-707 0A12 G2A

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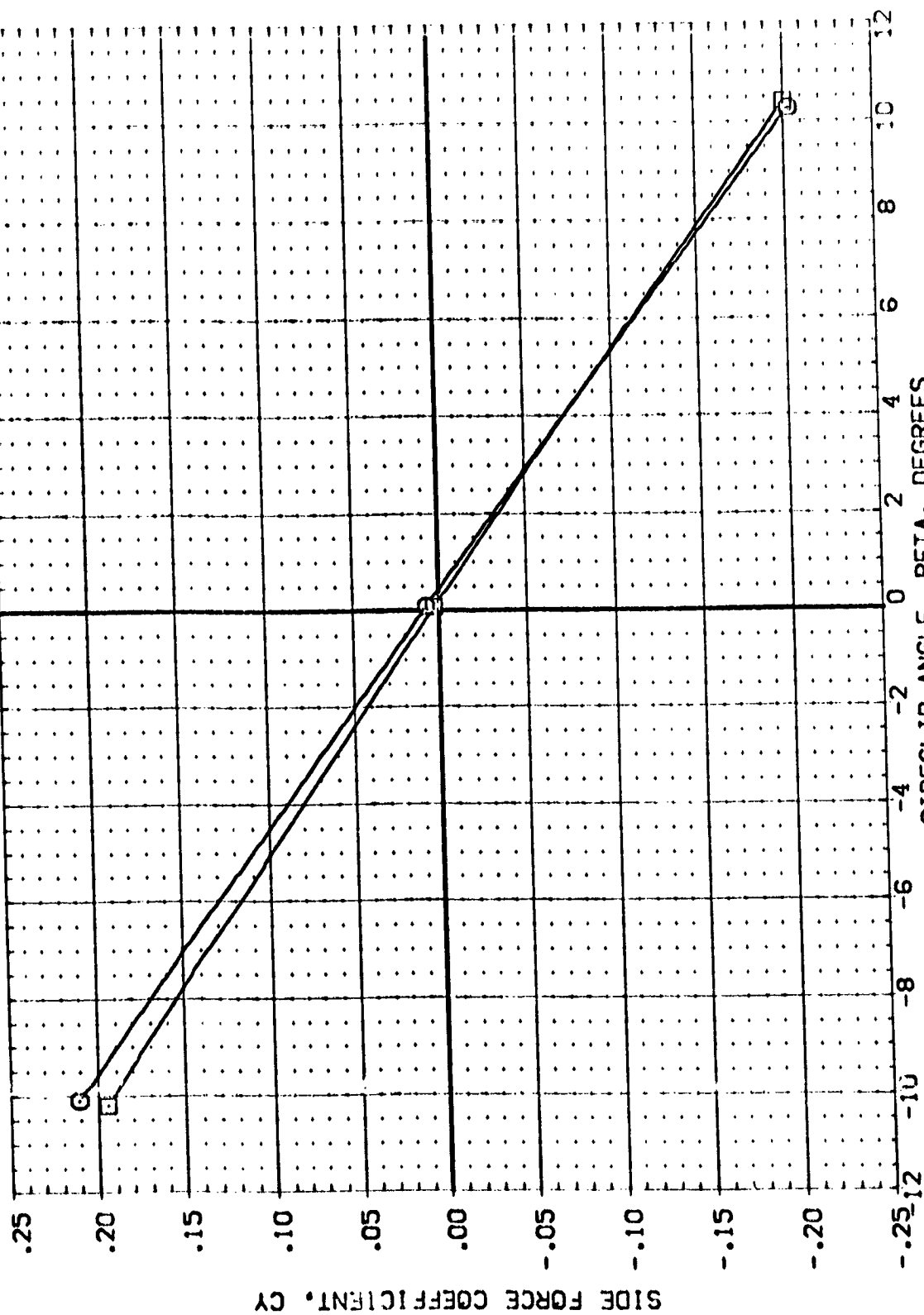


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., $\gamma_A=0.599$, 0.897

(RBPC19)

AMES 11-707 0A12 02A

SYNCD MACH .599 ALPHA 10.000 ELEVON 10.000
10 .897 RUDDER .000 RUDFLR .000

REFERENCE INFORMATION
SPEC 2.4212
LAGE 39.845
BAGE 39.845
XVBO 32.245
YVBO 32.245
ZVBO 32.245
SCALE 1.000

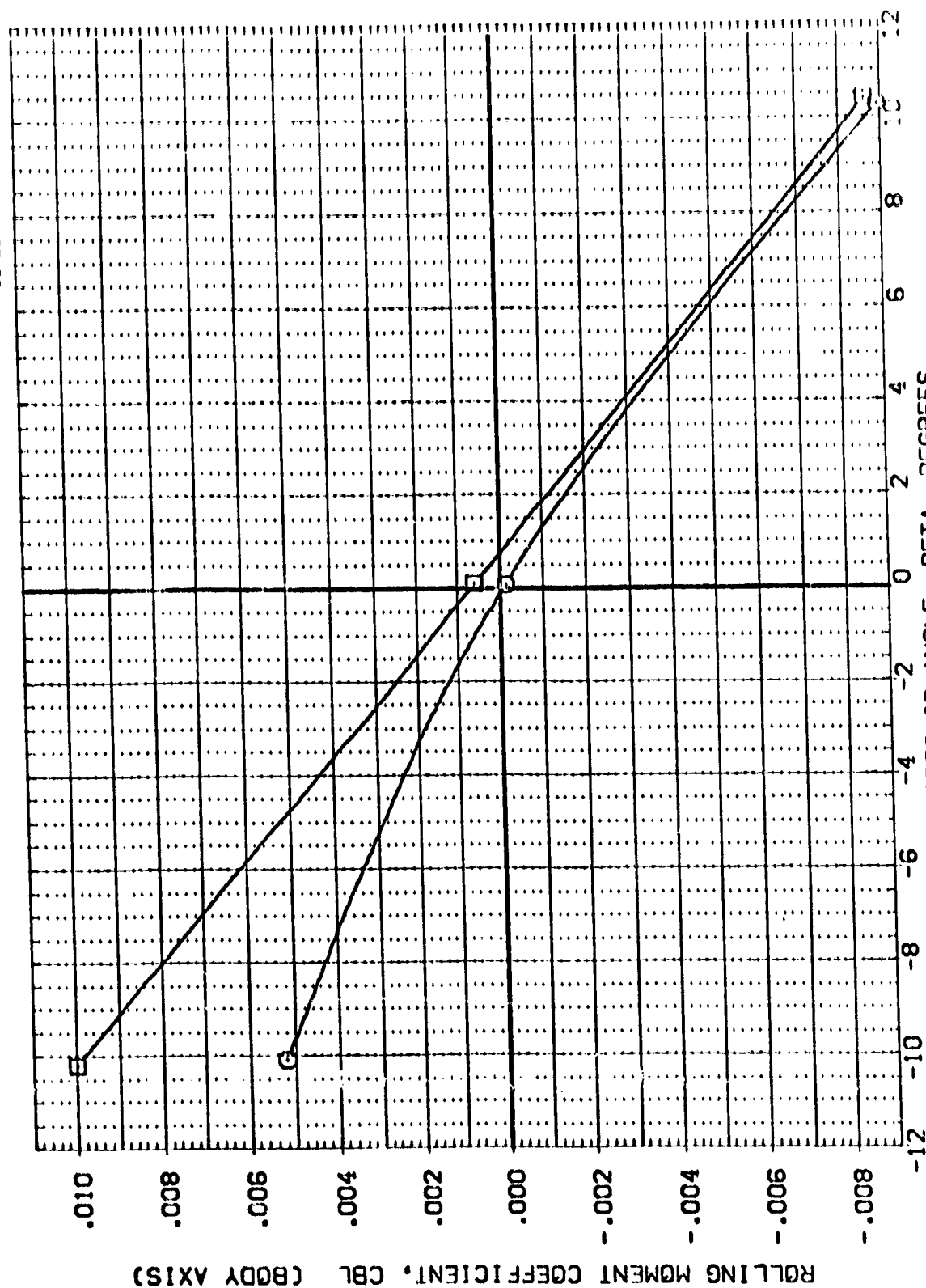


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., MN=0.599, 0.897

(RBP0:9)

AMES 11-707 0A12 02A

SYMBOL MAC. ALPHA RUDDER
 0 .599 .897
 PARAMETRIC VALUES
 10.000 10.000
 ELEVON RUDDER
 .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.6450 IN.
 BREF 38.8450 IN.
 XREF 37.3000 IN.
 YREF 0.0000 IN.
 ZREF 0.0000 IN.
 SCALE

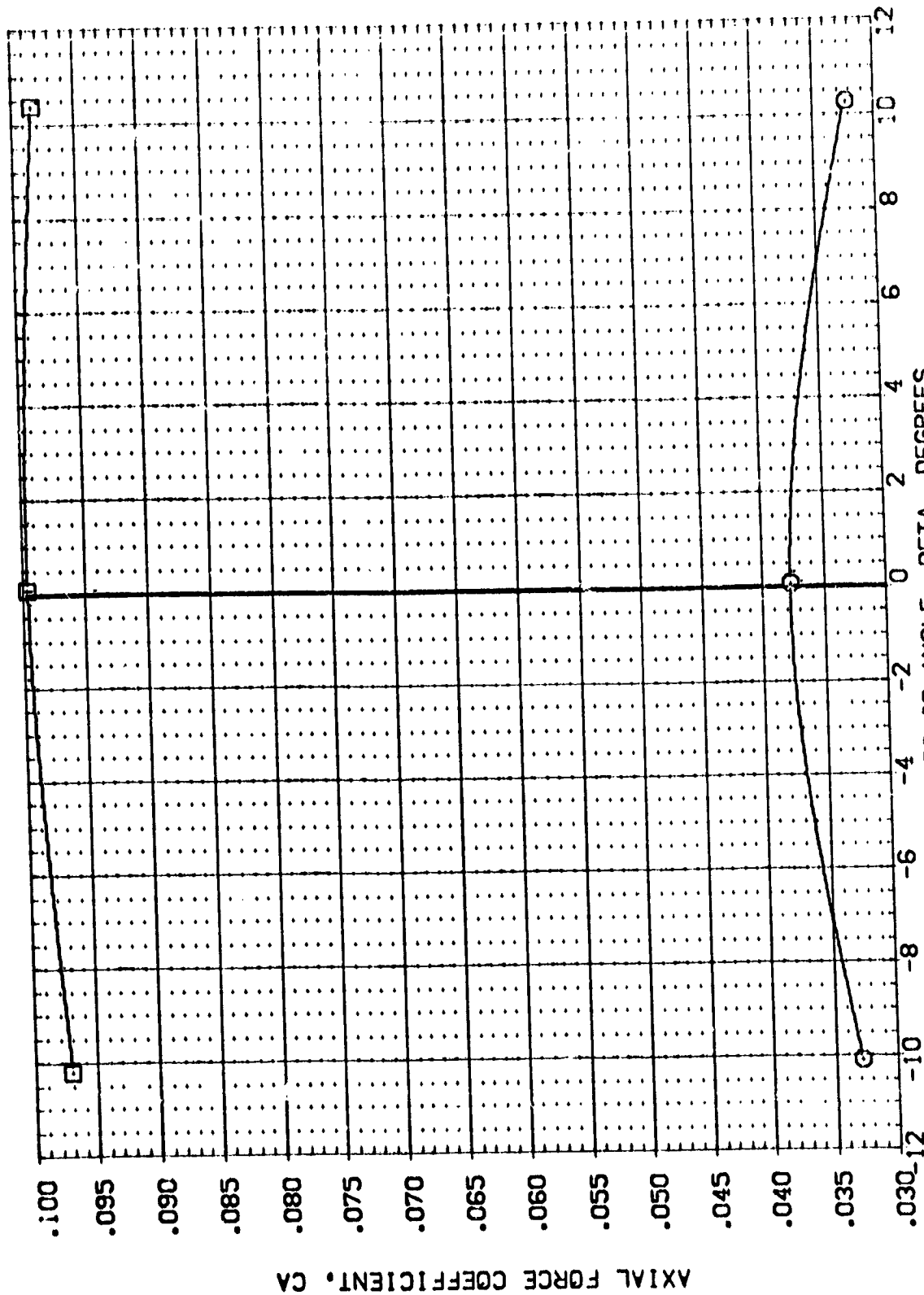


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., MN=0.599, 0.897

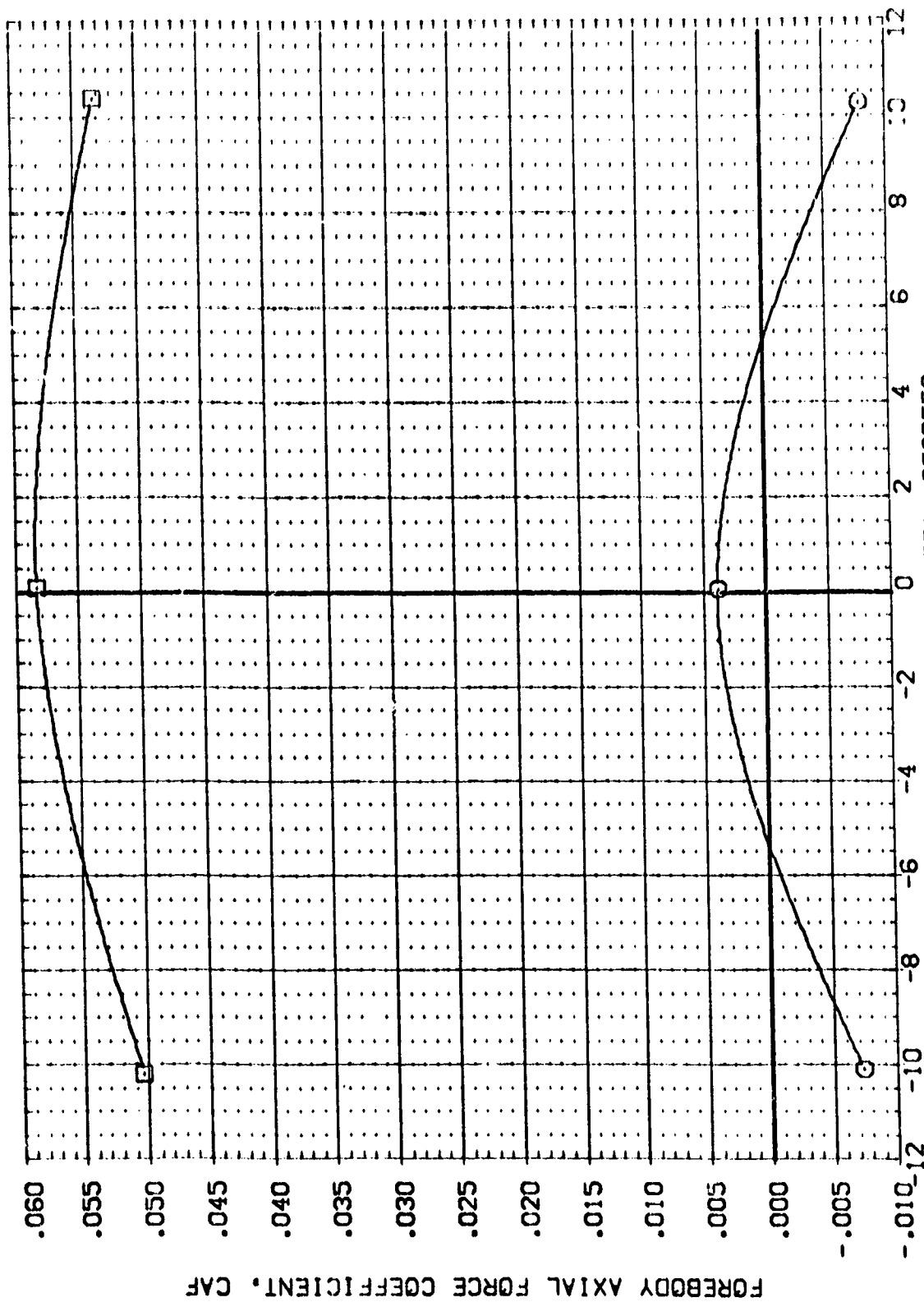
DATE 195

(RBP019)

AMES 11-707 0A12 02A

SYMBOL MAC- .592 .897
 PARAMETRIC VALUES
 10.000 10.000
 ELEVON RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4310
 REF 30.896
 SPEC 70.896
 WOP 31.300
 WOP 1000
 SCALE 1000



SIDESLIP ANGLE, BETA, DEGREES

FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., $WV=0.592, 0.897$

[RBP019]

AMES 11-707 CA12 02A

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

PARAMETRIC VALUES
 MACH .599 ALPHA 10.000 ELEVON 10.000
 .897 RUDDER .000 RUDDER .000

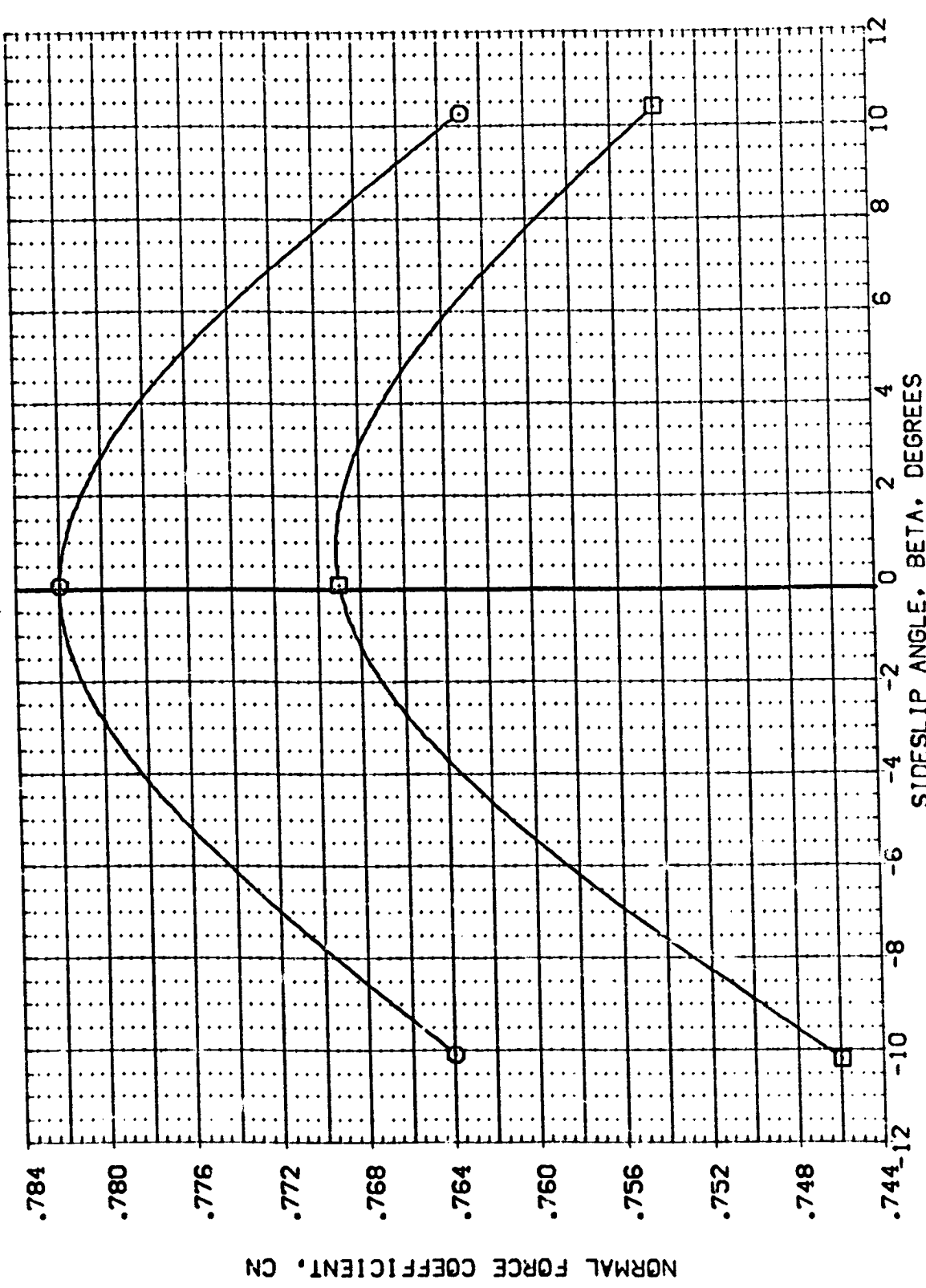


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., MN=0.599, 0.897
 SIDESLIP ANGLE, BETA, DEGREES
 ELEVON=10 DEGS.,

(RBP019)

AMES 11-707 0A12 02A

SYMBOL "ACH" PARAMETRIC VALUES
10.000 10.000 10.000
ELEVON RUOFLR
ALPHA
RUDDER
599
897

REFERENCE INFORMATION
SREF 2.4210 SQ. FT.
LREF 39.8460 IN.
BREF 39.8460 IN.
XMRP 32.3000 IN.
YMRP 0.0000 IN.
ZMRP 0.0000 IN.
SCALE 0.0000

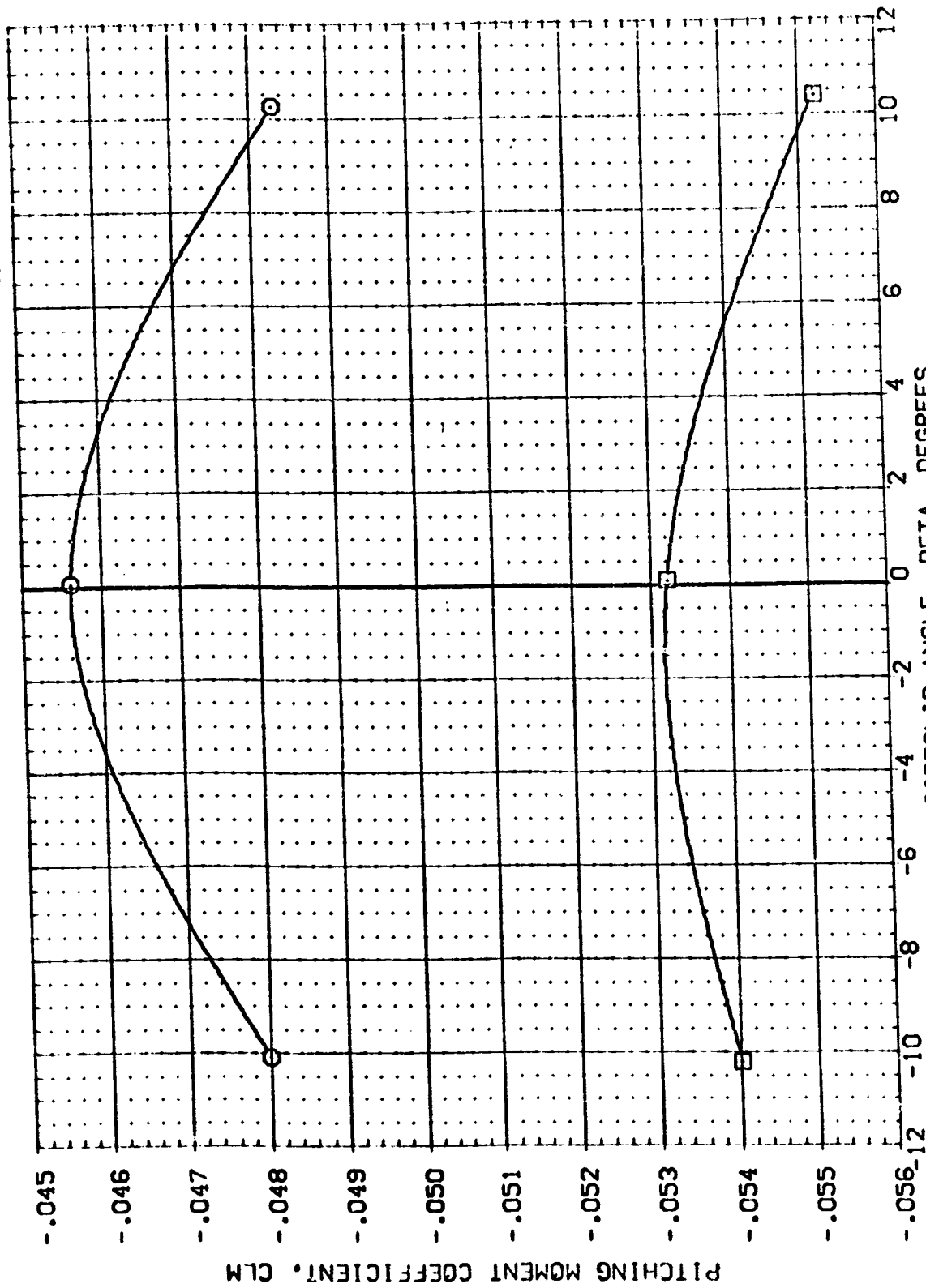


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., MN=0.599,0.897



AMES 11-707 0A12 02A

(RBP019)

SYMBOL	MACH		PARAMETRIC VALUES		REFERENCE INFORMATION	
	ALPHA	RUDER	10.000	ELEVON	10.000	SG.FT.
○	.599		.000			2.4210
□	.897		.000			39.8490
						39.8490
						32.3000
						.0000
						.0000
						.0300
						SCALE

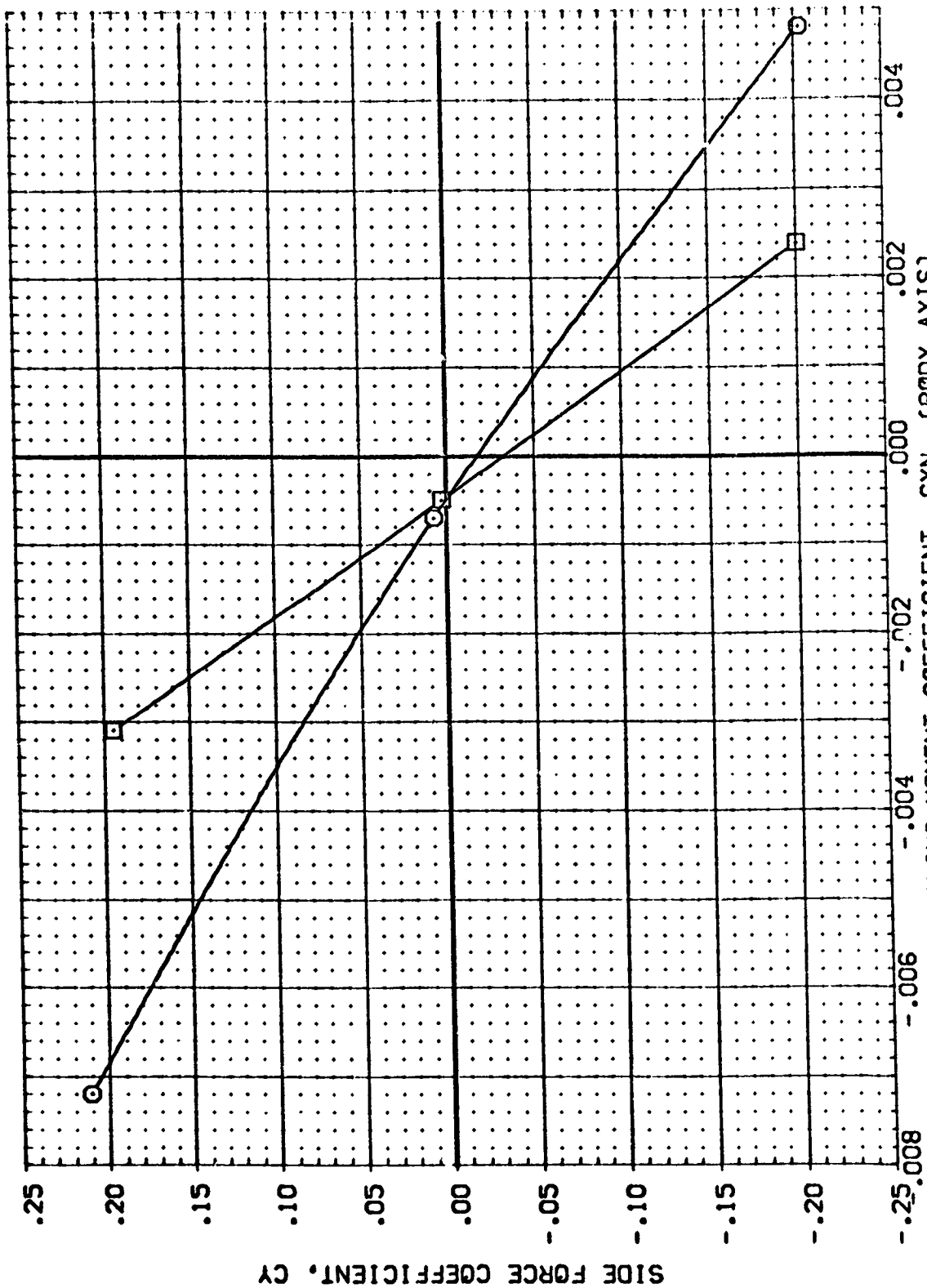


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., MN=0.599, 0.897

AMES 11-707 0A12 02A

(ABP0:9)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	10.000	10.000	
□	.599	RUDDER	10.000	ELEVON	.000	
	.897		.000	RUDFLR	.000	

REFERENCE INFORMATION	
SREF	2.4210
REF	.8490
BREF	39.8490
XPRP	32.3500
YPRP	.0000
ZPRP	.0000
SCALE	.0300

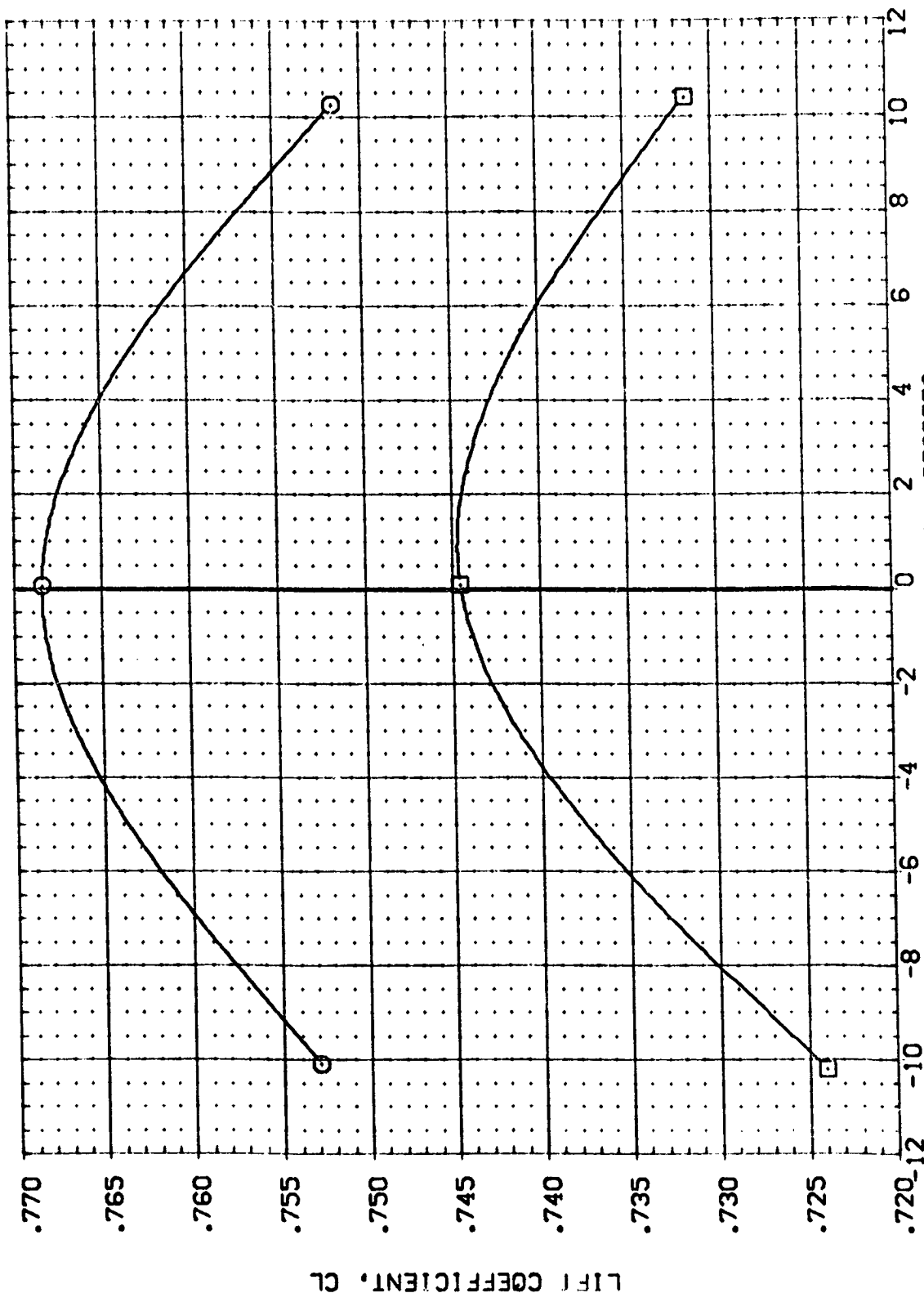


FIG.22 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=10 DEGS., MN=0.599, 0.897

(RBP020)

AMES 11-707 0A12 02A

SYMBOL		MACH		PARAMETRIC VALUES		10.000	
SYMBOL	VALUE	ALPHA	RUDER	15.000	ELEVON	RUDER	VALUE
SYMBOL	VALUE	ALPHA	RUDER	15.000	ELEVON	RUDER	VALUE
SYMBOL	VALUE	ALPHA	RUDER	15.000	ELEVON	RUDER	VALUE

REFERENCE INFORMATION

SYMBOL	VALUE	UNIT
SREF	2.4210	sq.ft.
LREF	39.8400	in.
BREF	39.8400	in.
XPRP	32.3000	in.
YPRP	.0000	in.
ZPRP	.0000	in.
SCALE	.0000	SCALE

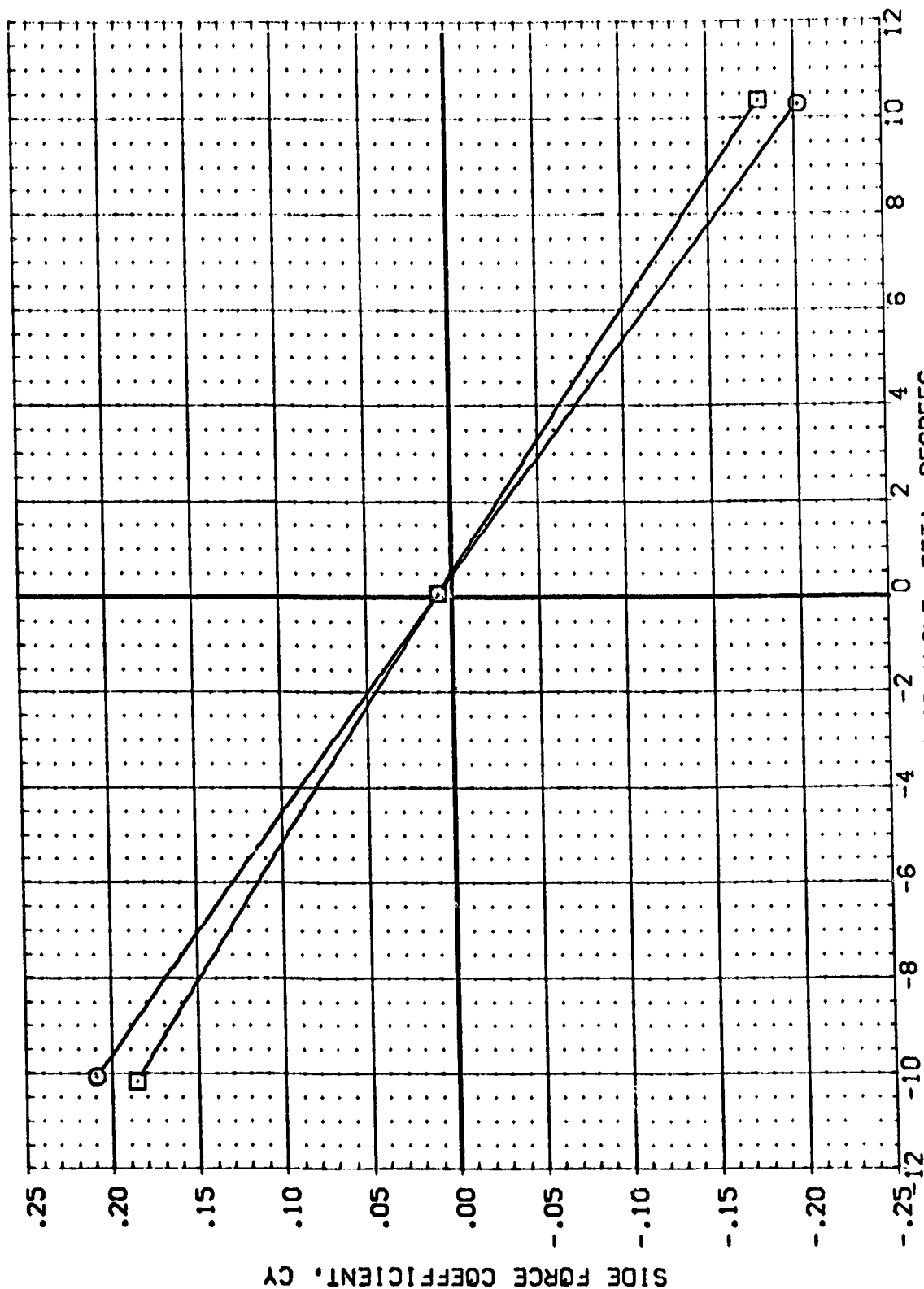


FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., MN=0.599,0.902

(RBP020)

AMES 11-707 CA12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDDER
□	.599	15.000	10.000	.000	
□	.902	.000	.000	.000	

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
YREF 32.3000
ZREF 1.0000
SCALE 1.000

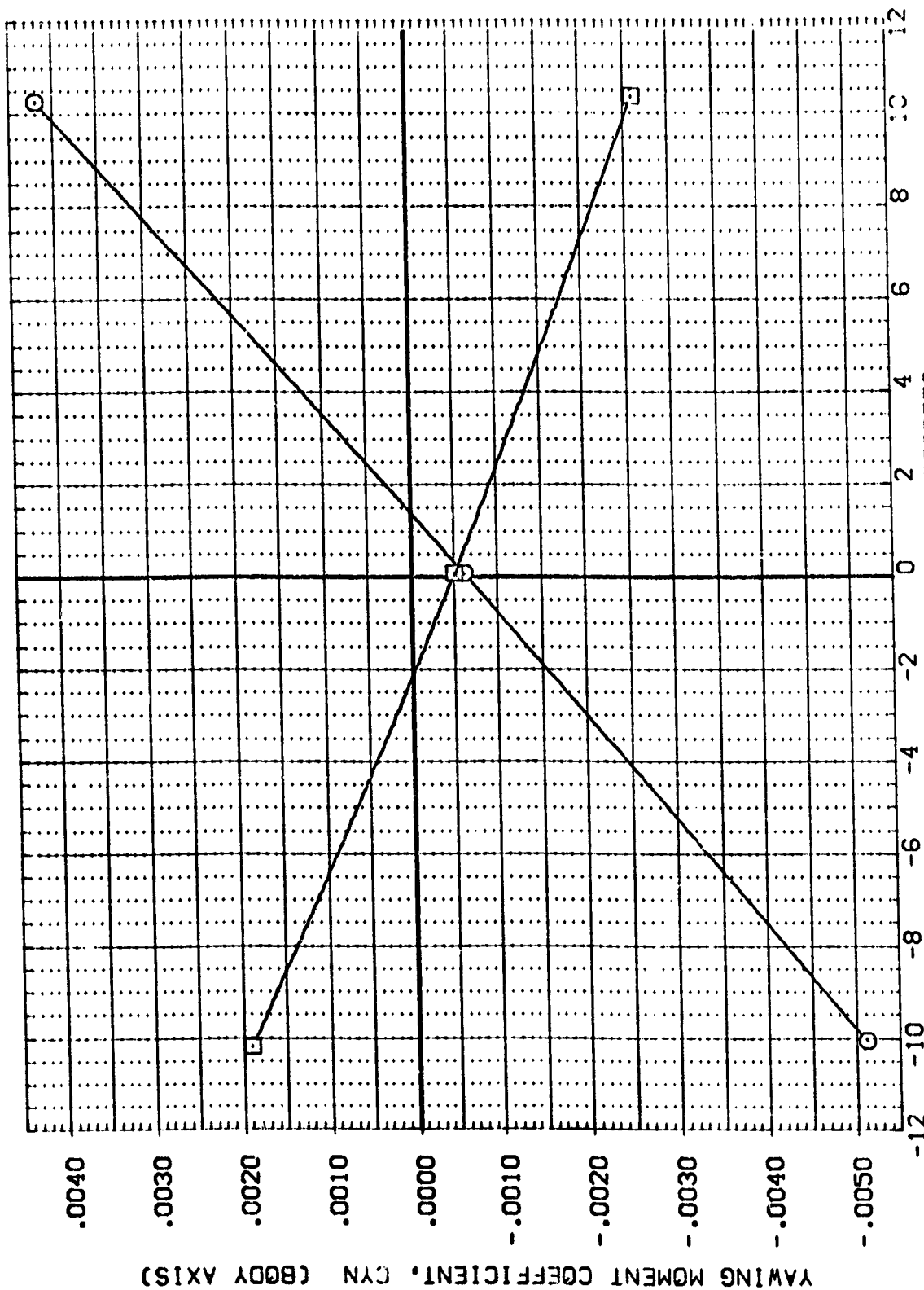


FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., MN=0.599, 0.902
ELEVON=10 DEGS.,



AMES 11-707 0A12 02A

(RBP020)

SYMBOL MACH ALPHA RUDDER
O .599 .000
□ .932 .000

PARAMETRIC VALUES
ELEVON 10.000
RUDDER .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

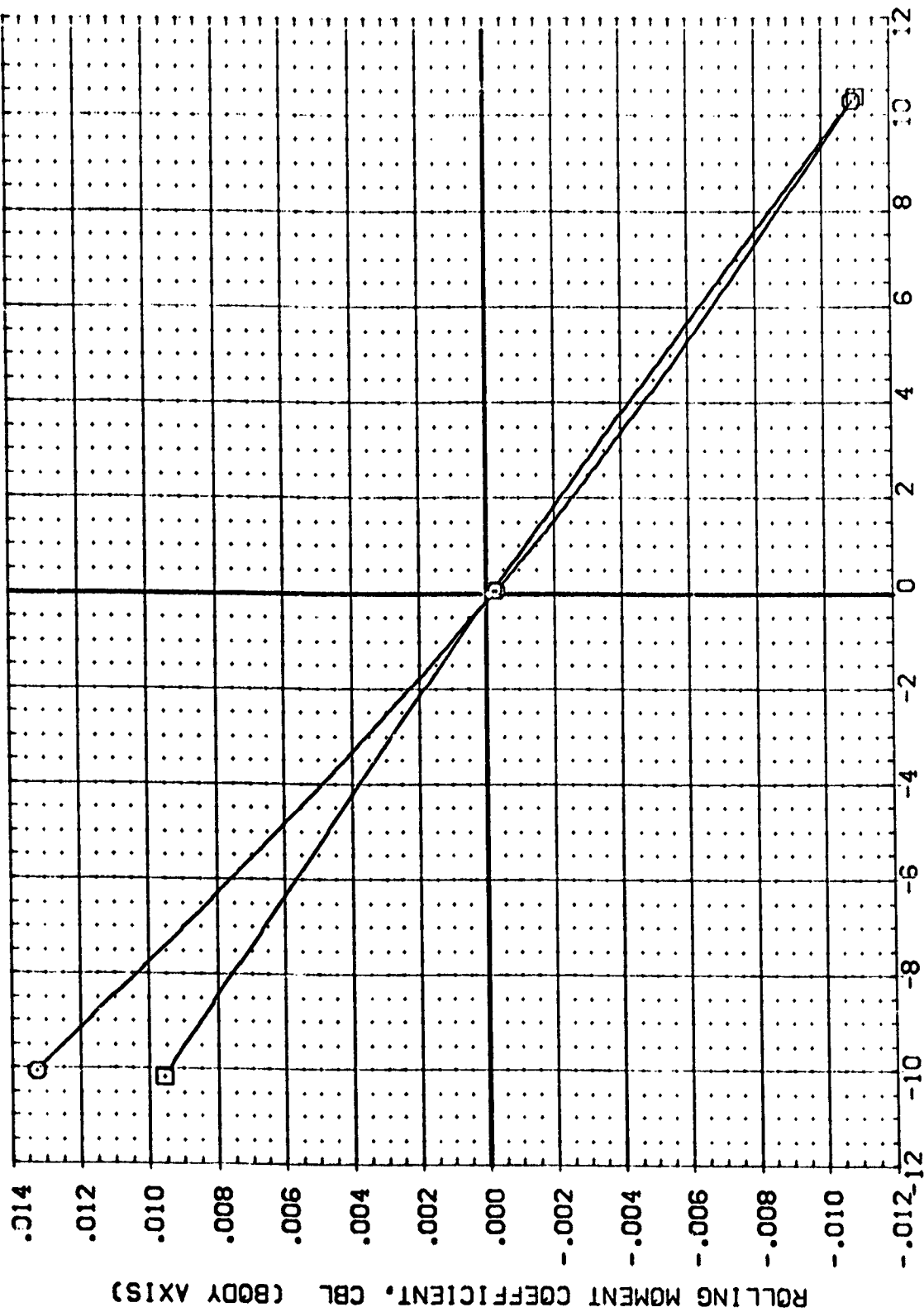


FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., MN=0.599,0.902

[RBPO20]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER 10.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ. FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
VMXP 32.3000 IN.
VMPO 0.0000 IN.
ZMXP 0.0000 IN.
ZMPO 0.0000 IN.
SCALE

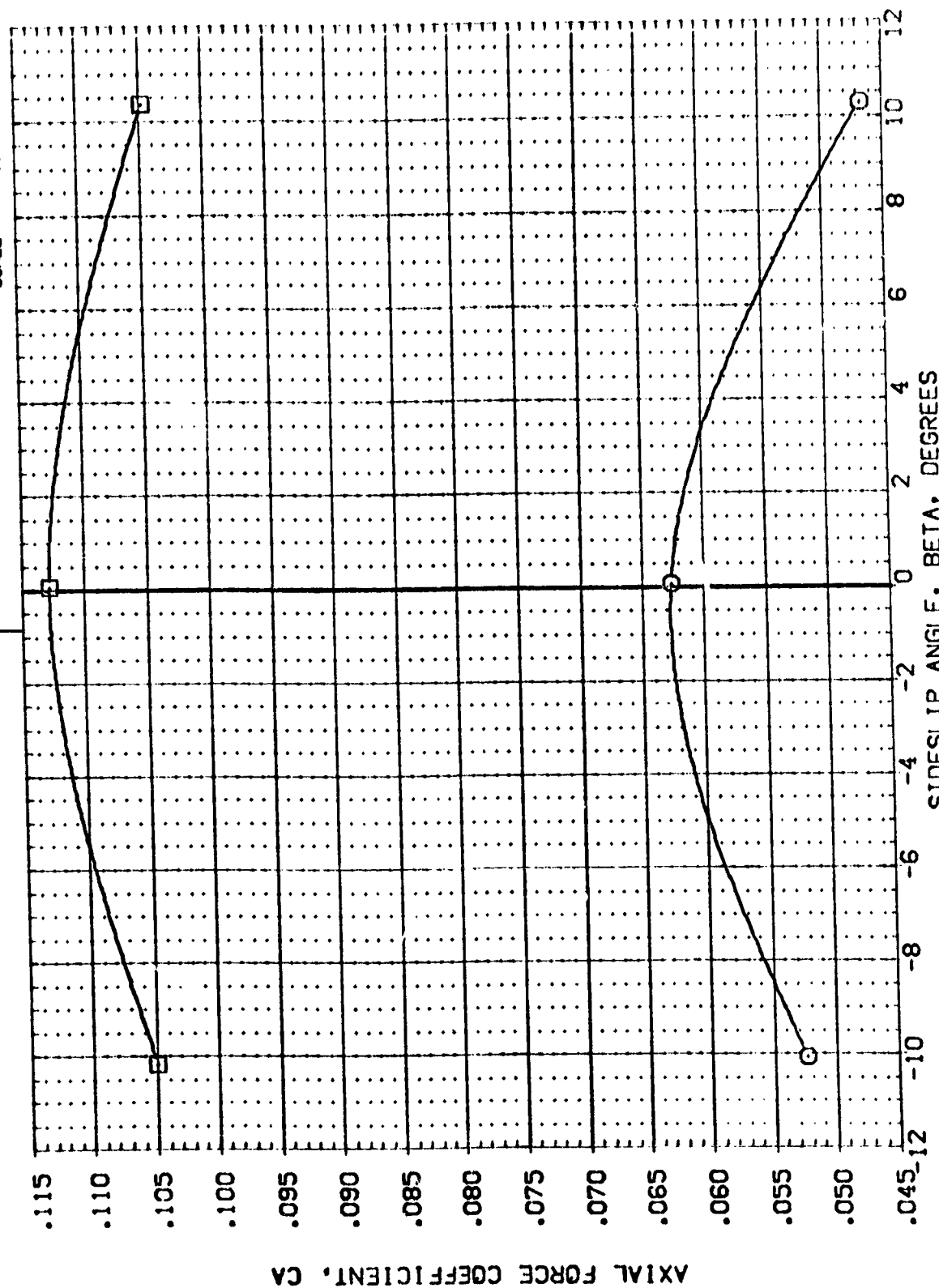


FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., MN=0.599, 0.902



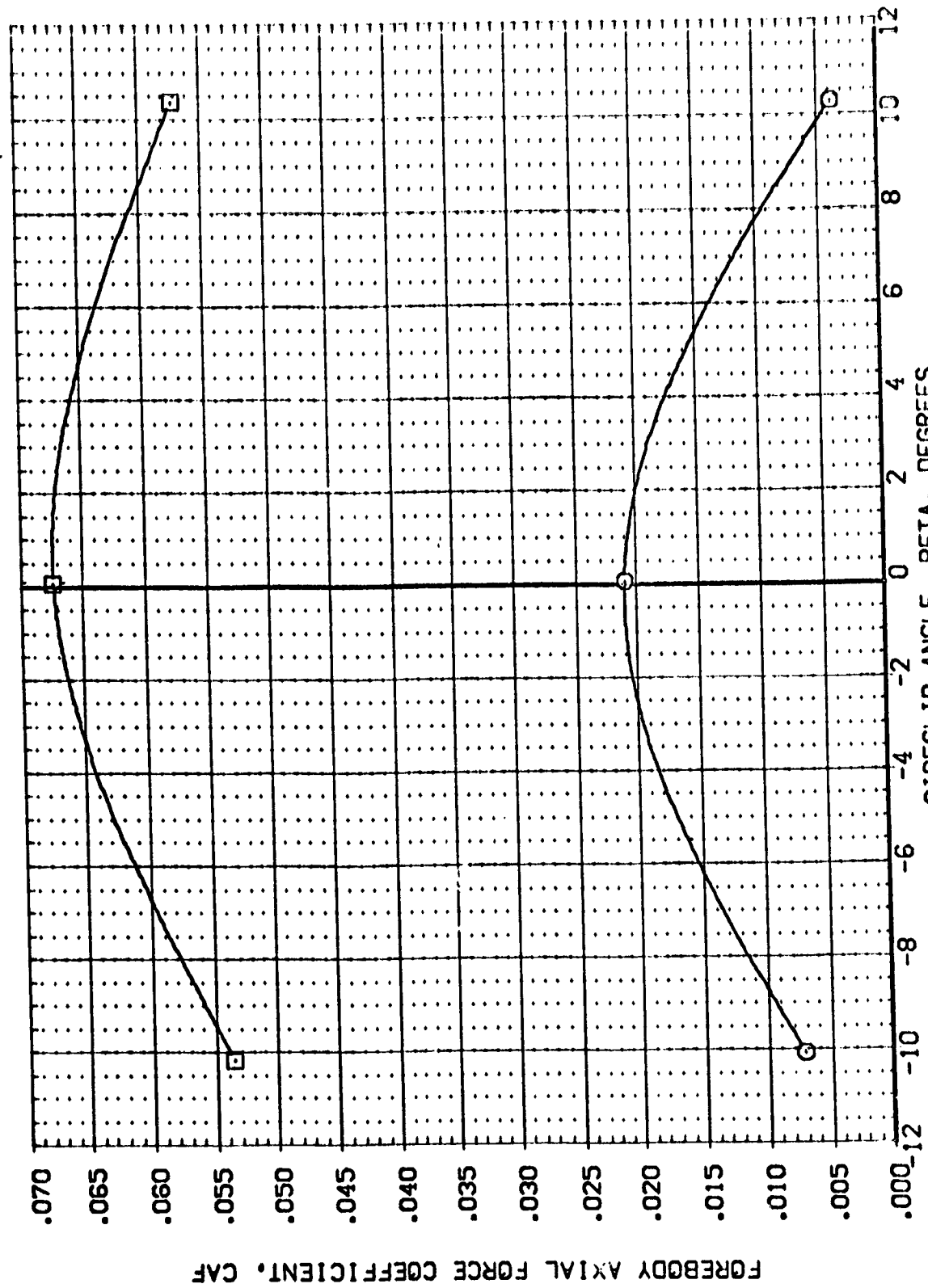
AMES 11-707 0A12 02A

(RBP020)

SYMBOL MACH ALPHA RUDDER
 □ .599 .902
 □ .000 .000

PARAMETRIC VALUES
 15.000 ELEVON
 .000 RUDDLER

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XMRP 32.3000
 YMRP 0.0000
 ZMRP 0.0000
 SCALE .1300



SIDESLIP ANGLE, BETA, DEGREES

FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., MN=0.599, 0.902



AMES 11-707 0A12 02A

(RBP020)

SYMBOL MACH ALPHA RUDDER
 O .598 .972
 PARAMETRIC VALUES
 15.000 ELEVON 10.000
 .000 RUOFLR .000

REFERENCE INFORMATION
 SPEC 2.4212
 REF 38.8450
 SPEC 38.8450
 XREF 32.2000
 YREF .0000
 ZREF .0000
 SCALE .0000

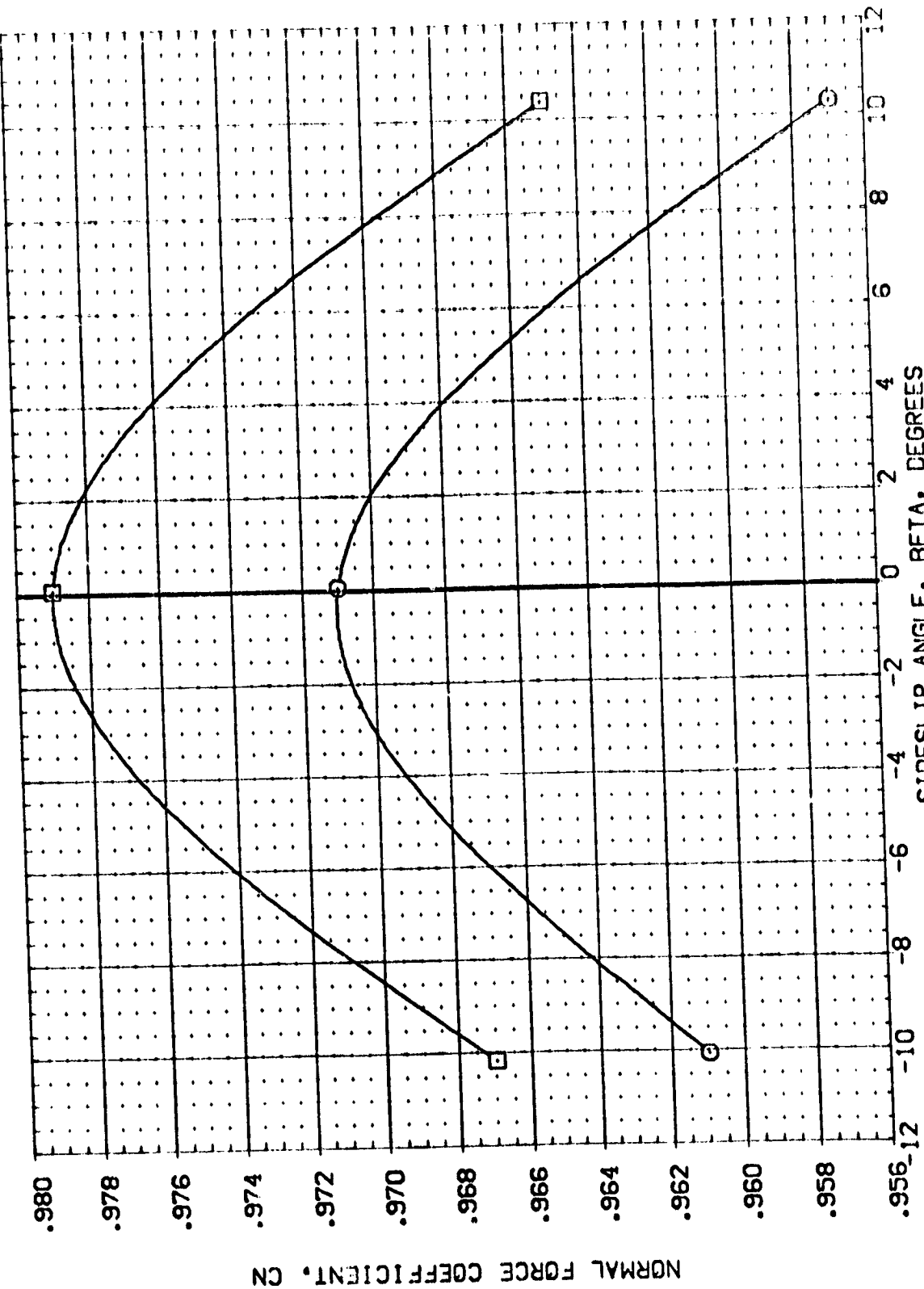


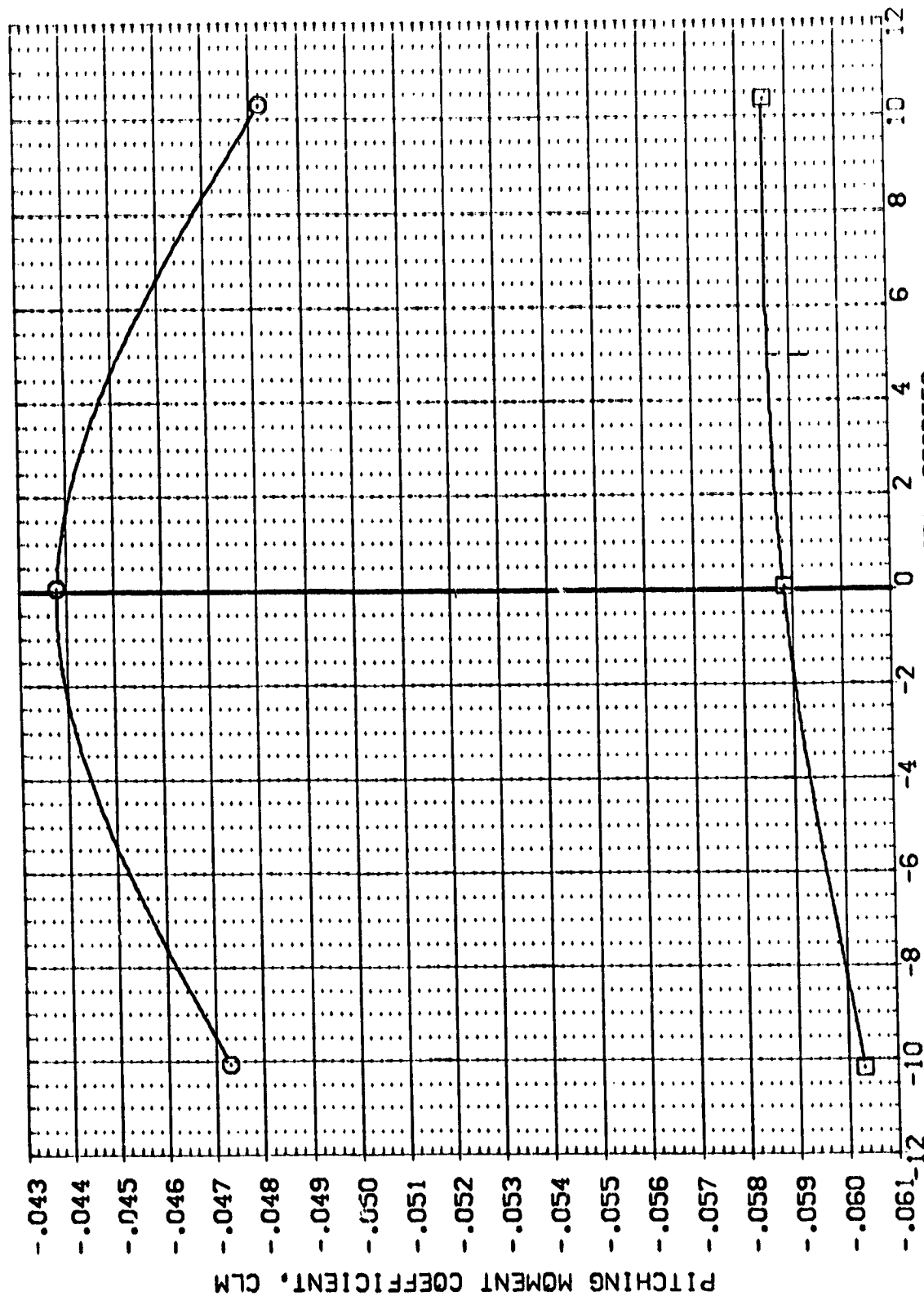
FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., YAW=0.598, 0.902
 PAGE 178

(RBP020)

AMES 11-707 CA12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES ELEVON RUJFLR 10.000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8450
BREF 38.8450
XREF 32.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., $M=0.599$, $C_{D0}=0.002$

AMES 11-707 0A12 02A

SCALE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
SCALE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

SYMBOL	WACH	PARAMETRIC VALUES
○	.599	ALPHA .5,000 ELEVON
○	.902	RODDER .000 RODDER
		10.000
		.000

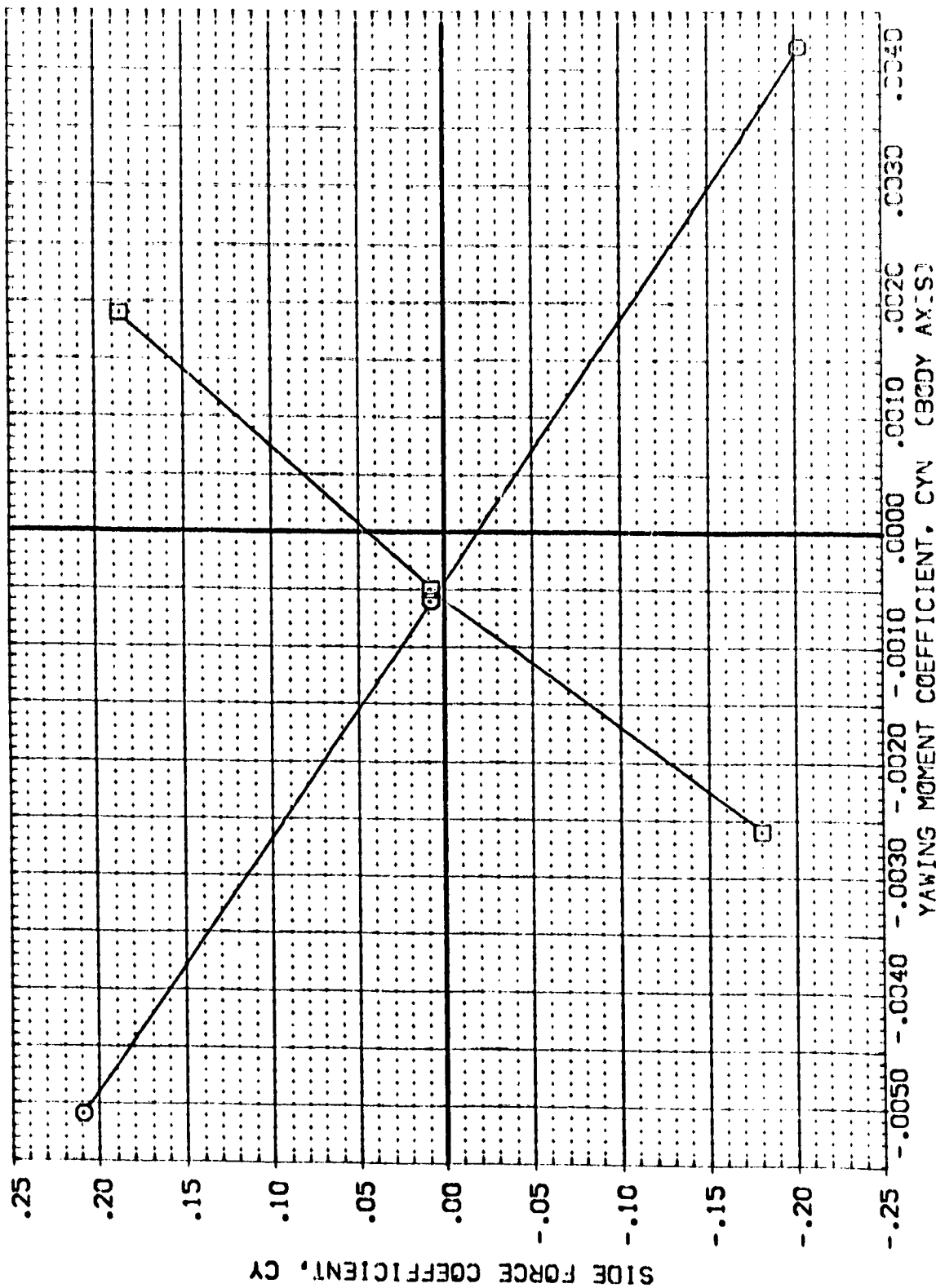


FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVEN=10 DEGS., W=0.599, C.932

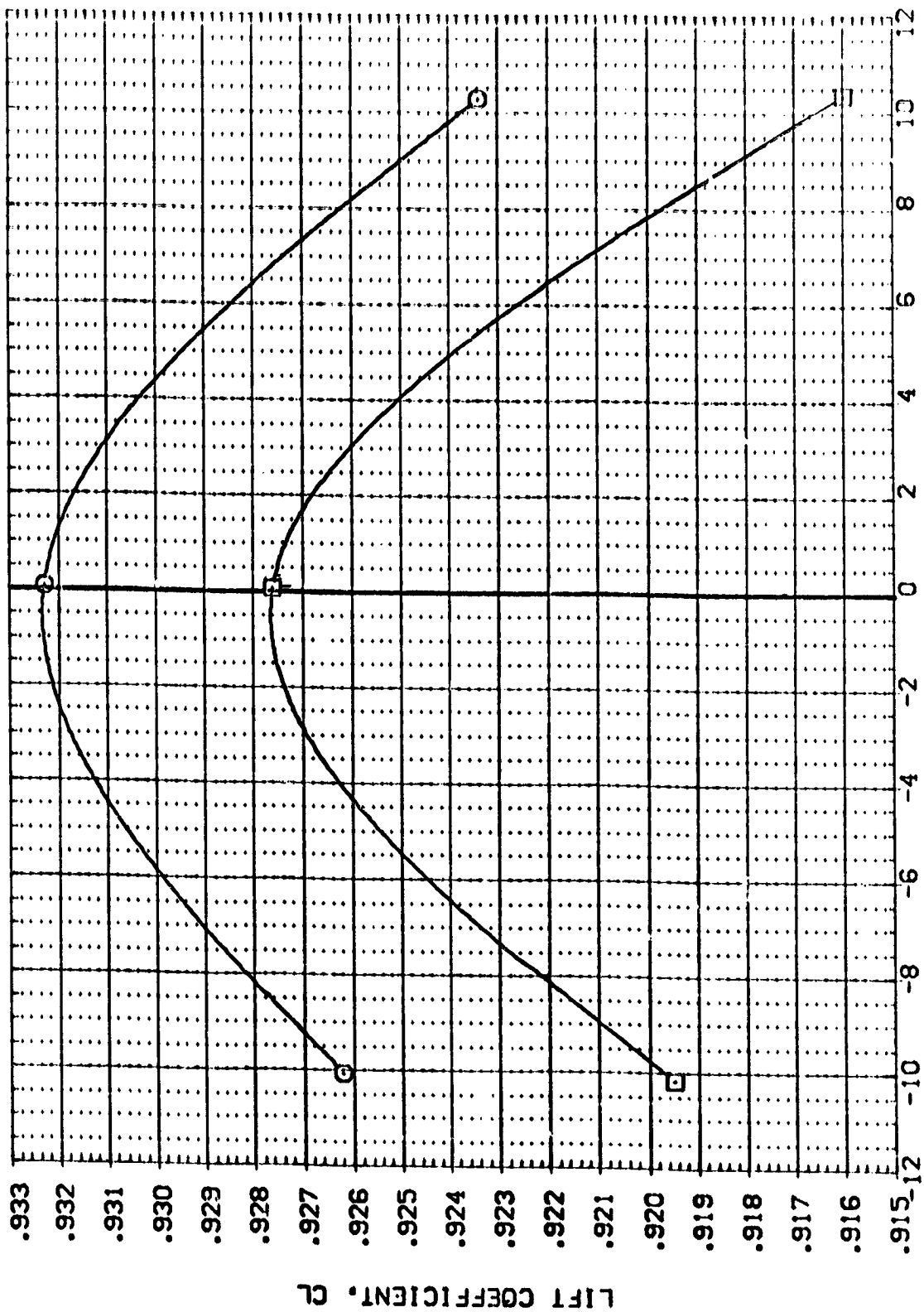


AMES 11-707 0A12 02A

(ABP020)

SYMBOL MACH ALPHA ELEVON RUOFLR
☐ .589 .902 15.000 .000 10.000 .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.816
 BREF 39.816
 XREF 32.000
 YREF 1.000
 ZREF 1.000
 SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.23 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=10 DEGS., $MACH=0.589$, $MACH=0.902$

AMES 11-707 0A12 02A

(REP021)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER .000 .000 10.000 .000

REFERENCE INFORMATION
SREF 2.4213 SQ.FT.
LREF 26.8160
BREF 32.8160
XREF 32.3160
YREF 32.3160
ZREF 32.3160
SCALE

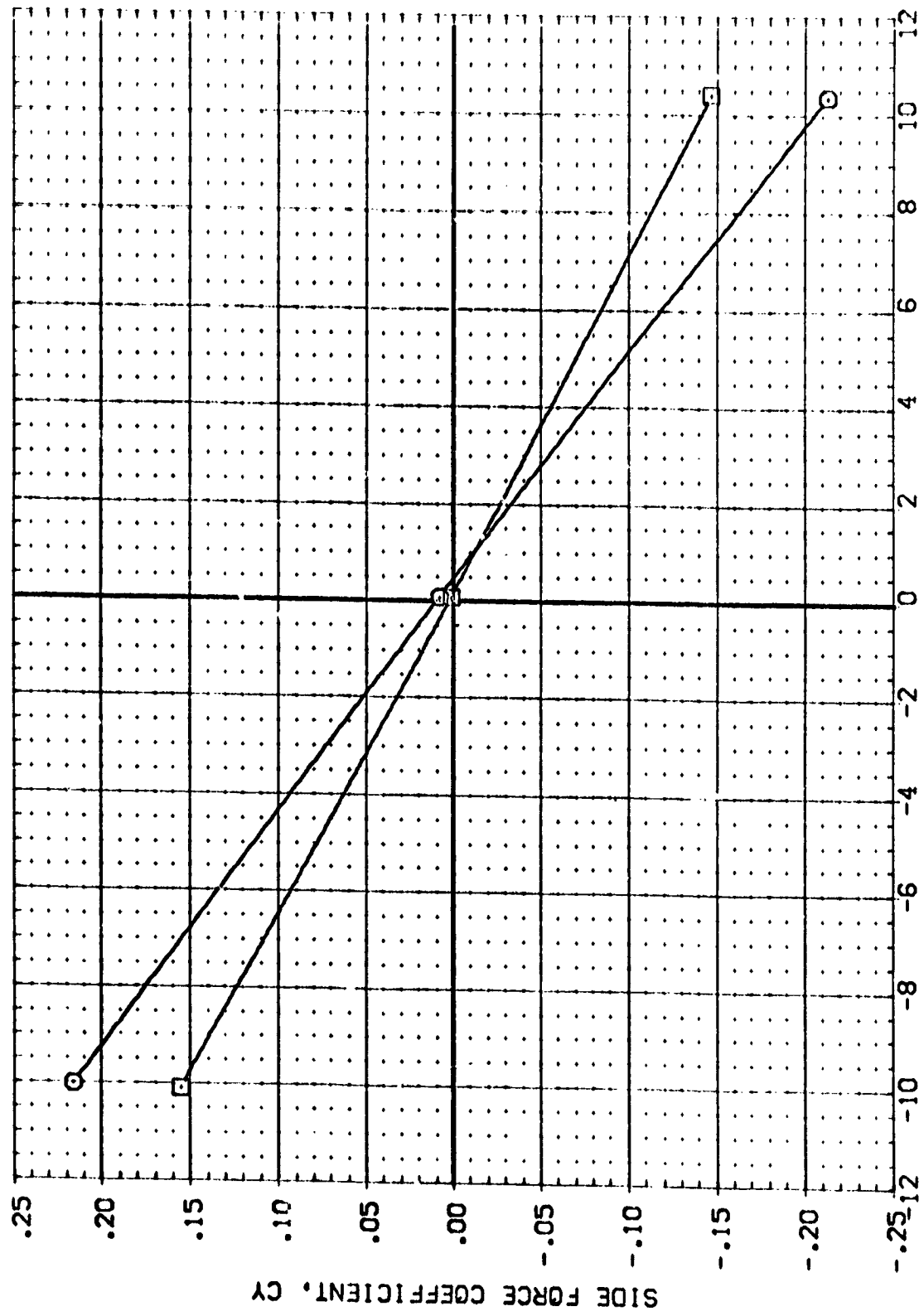


FIG.24 ORBITER LAT-OIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600,0.901

(RBPO21)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
		ALPHA	20.000	ELEVON	SREF	2.4210	SQ.FT.
□	.600	RUDDER	.000	RUOFLR	LREF	38.8450	IN.
	.901				BREF	38.8450	IN.
					XMRP	32.3000	IN.
					YMRP	.0000	IN.
					ZMRP	.0000	IN.
					SCALE	.0300	SCALE

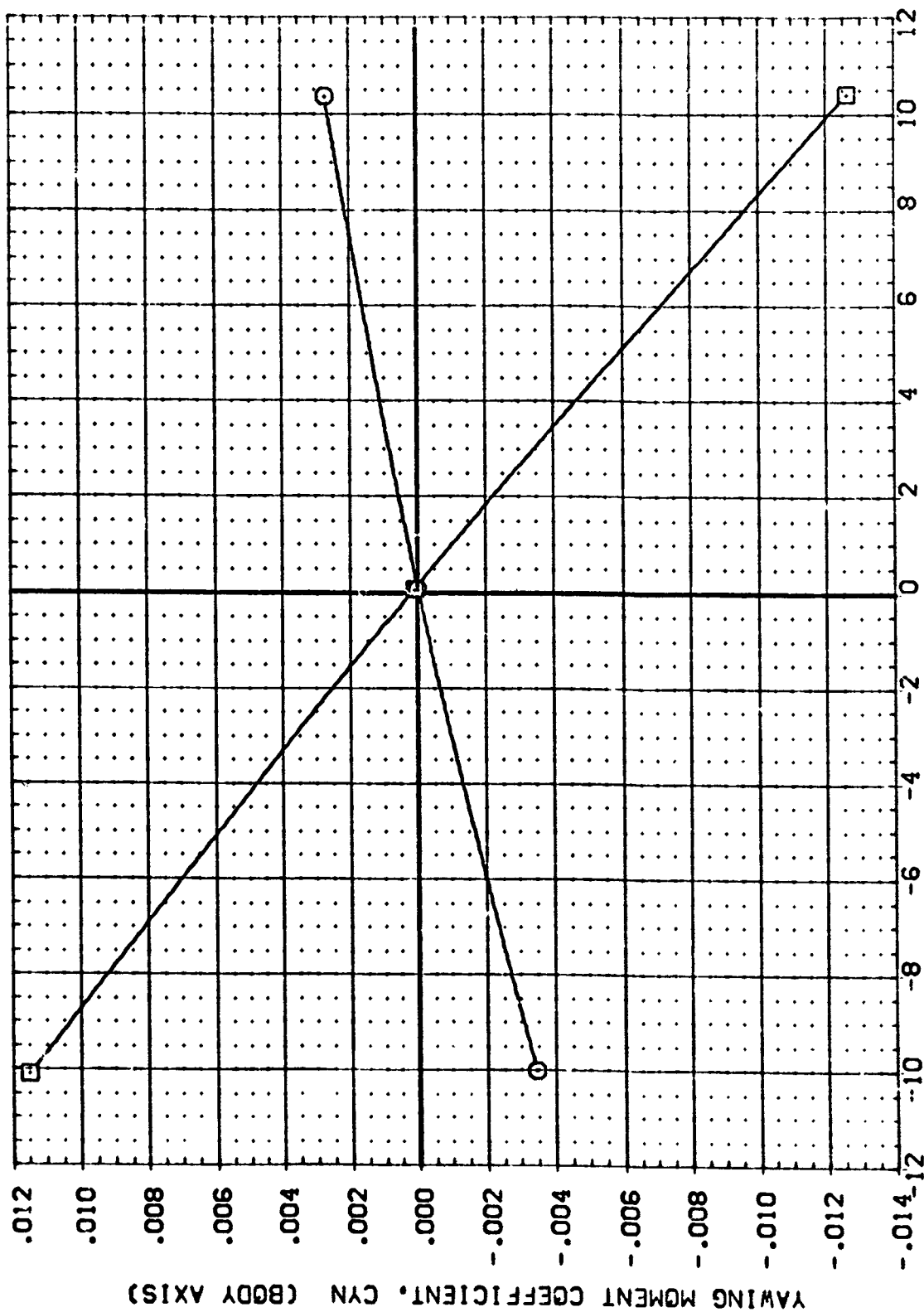


FIG.24 ORBITER LAT-DIR. DATA AT ALPHA-20 DEGS., ELEVON=10 DEGS., MN=0.600,0.901

(RBPO21)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600
○ .901

PARAMETRIC VALUES
20.000 ELEVON 10.000
.000 RUDFLR .000

REFERENCE INFORMATION:
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

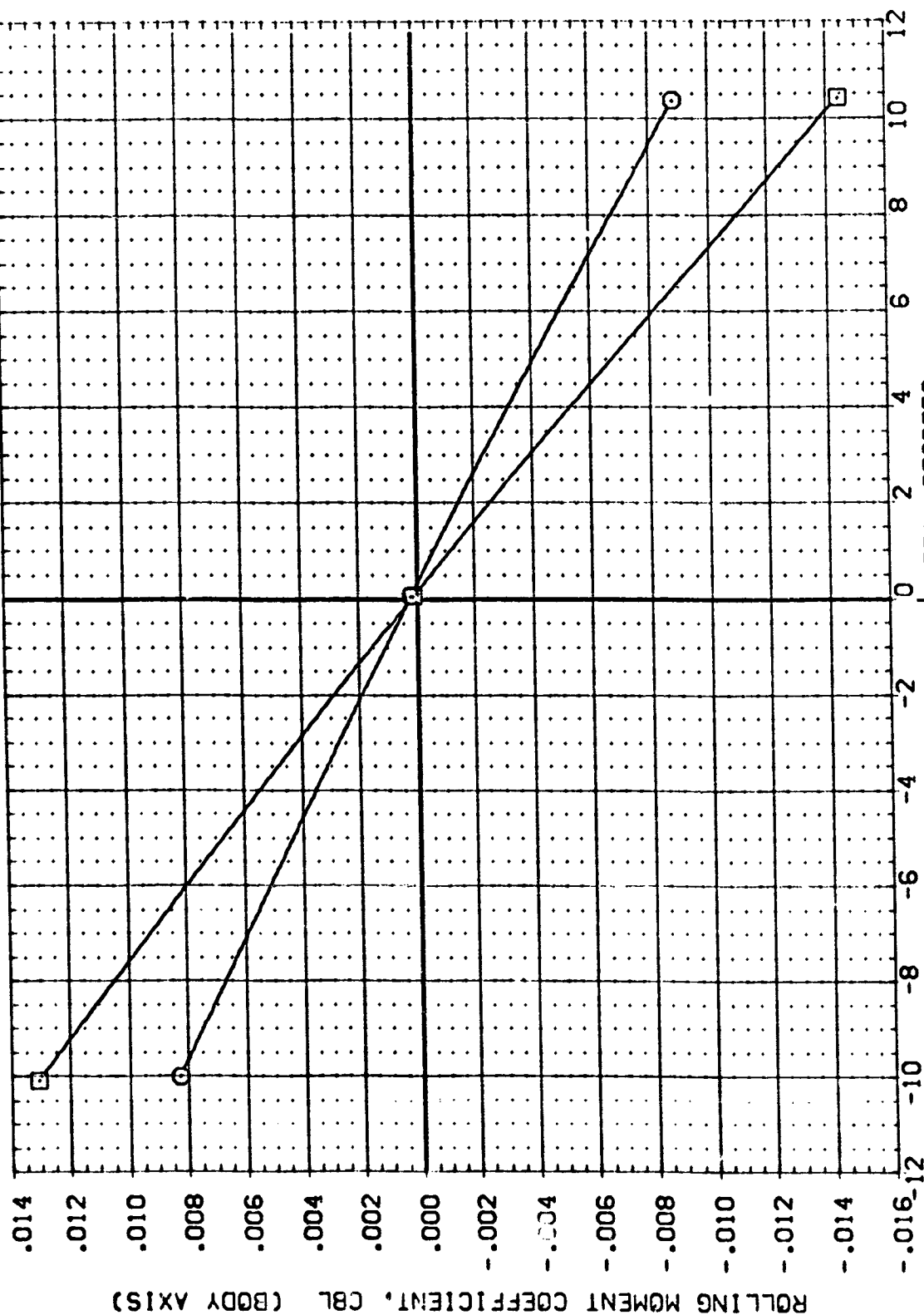


FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600,0.901

(RBPO21)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

SYMBOL MACH ALPHA RUDDER
O .600
□ .901

PARAMETRIC VALUES
20.000 ELEVON 10.000
.000 RUOFLR .000

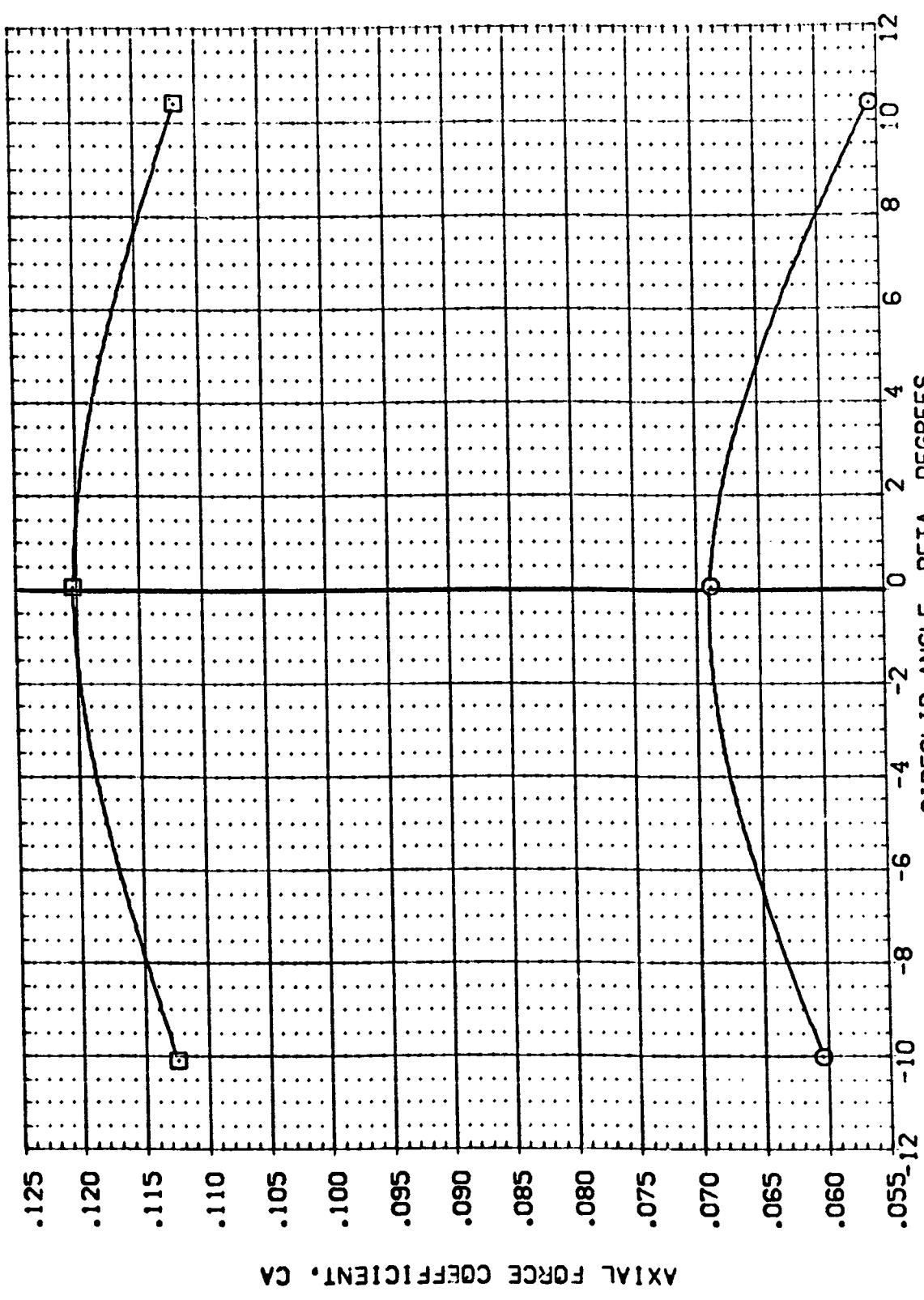


FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600, 0.901
PAGE :83



AMES 11-707 0A12 02A

(RBPO21)

SYMBOL MACH ALPHA RUDDER
 ○ .600
 □ .901

PARAMETRIC VALUES
 20.000 ELEVON 10.000
 .000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

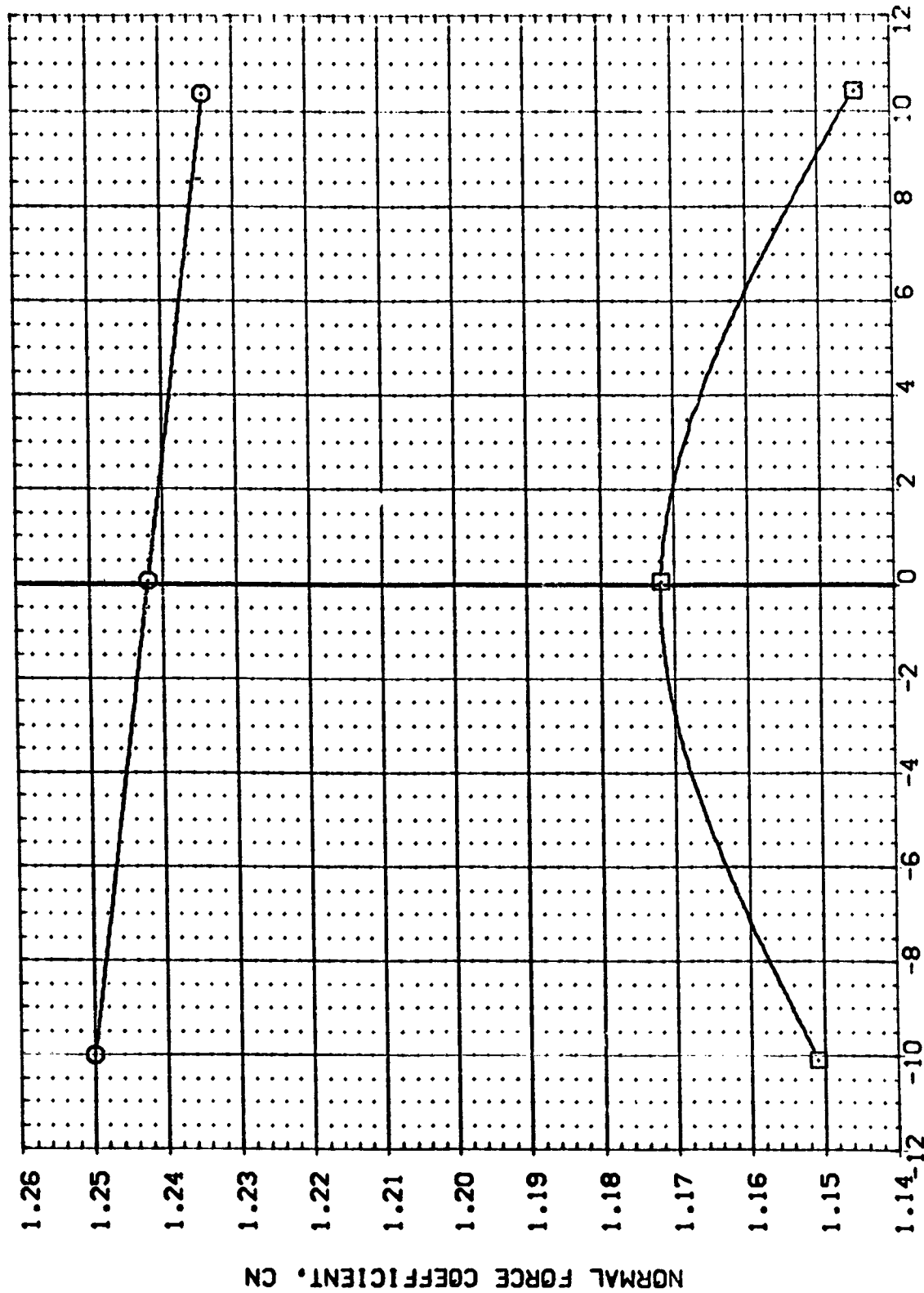


FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600, 0.901

(RBP021)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES			
		ALPHA	20.000	ELEVON	10.000
□	.600	RUDDER	.000	RUDDER	.000
□	.901				

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
BREF	39.8490
XGRP	32.3000
YGRP	.0000
ZGRP	.0000
SCALE	.0300

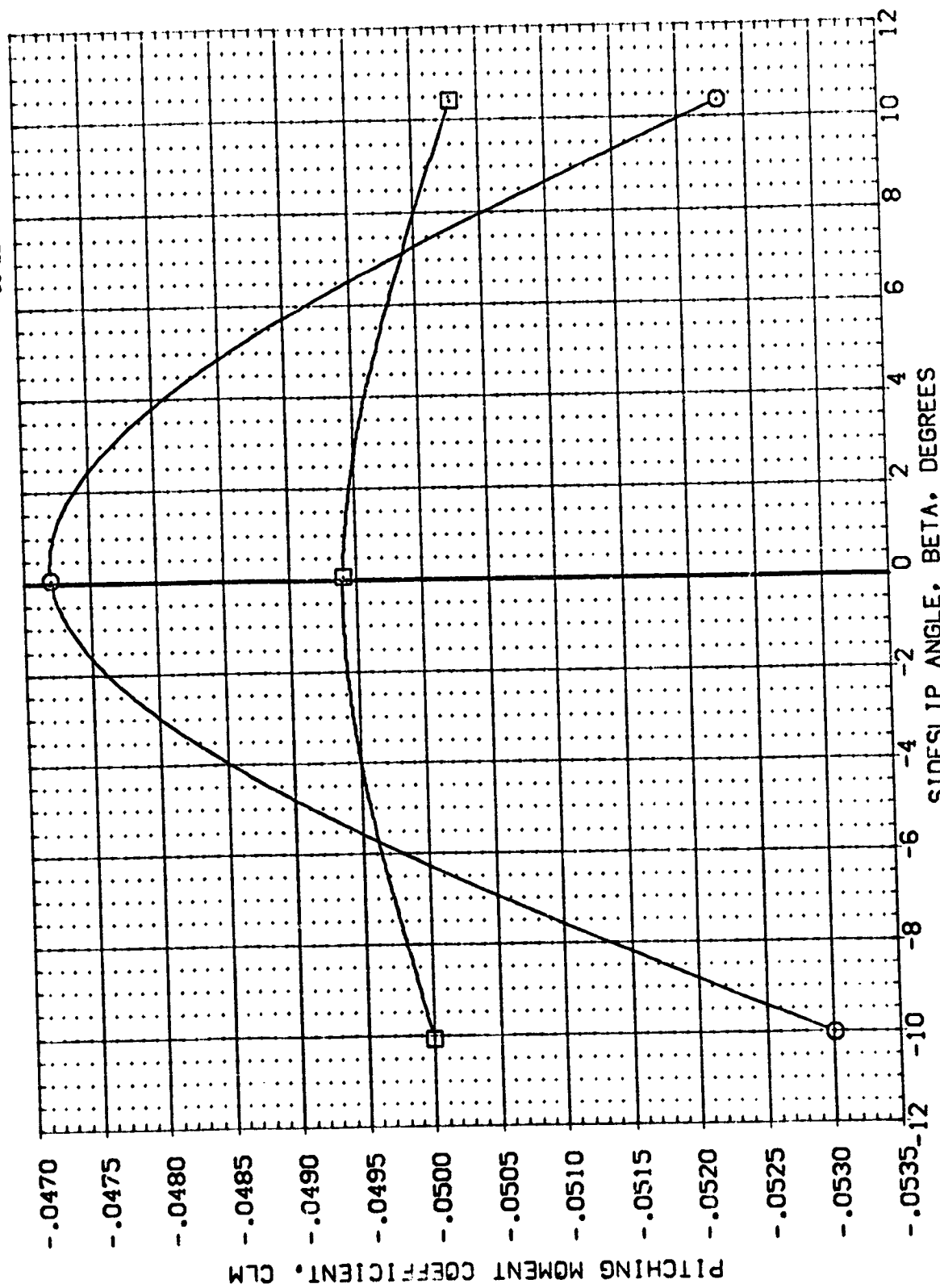
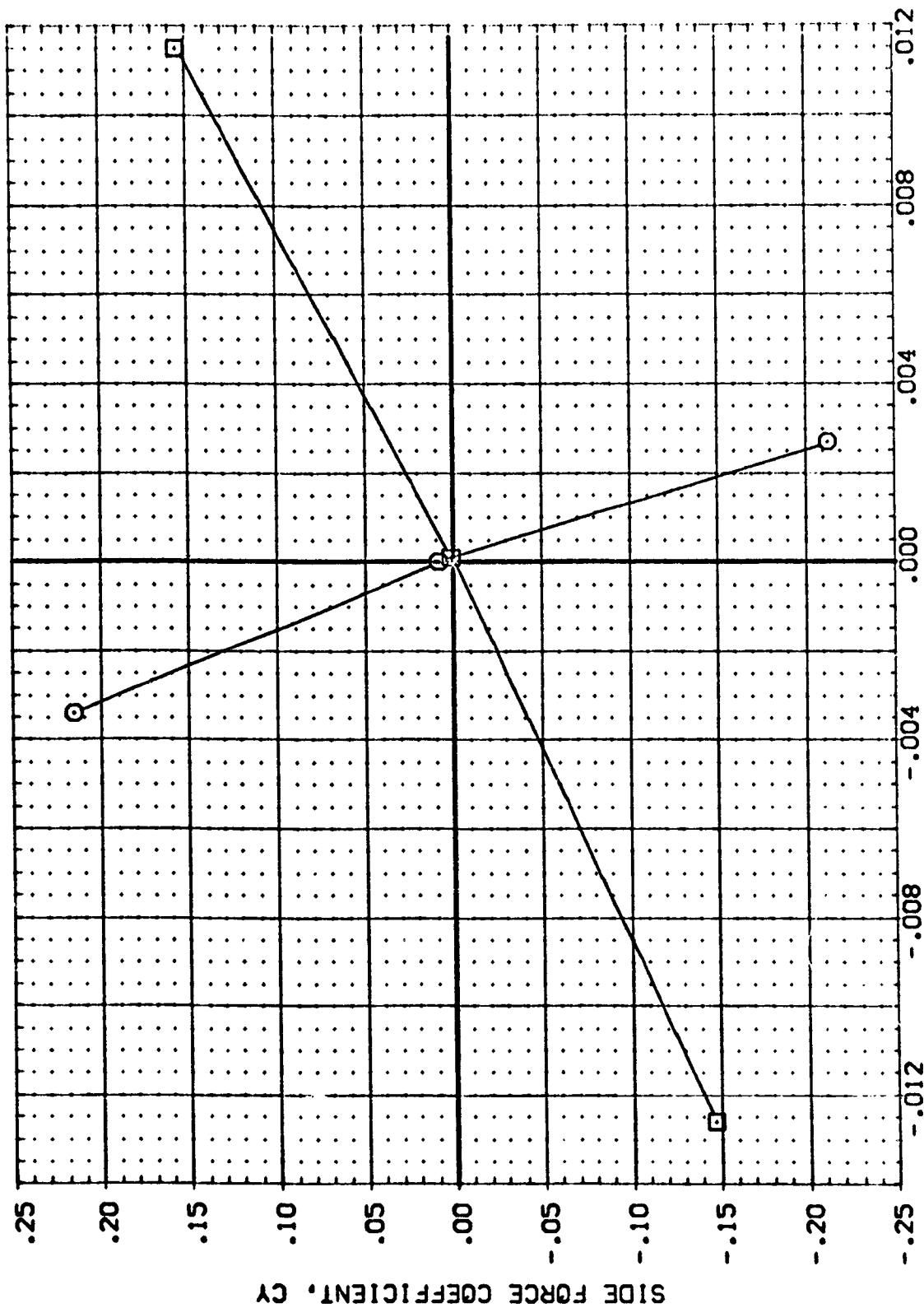


FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600, 0.901

(RBP021)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.600	ALPHA 20.000 ELEVON 10.000	SREF 2.4210 SC.FT.
○	.901	RUDDER .000 RUDDLR .000	LREF 39.8490 IN.
			BREF 39.8490 IN.
			XMRP 32.3000 IN.
			YMRP .0000 IN.
			ZMRP .0000 IN.
			SCALE .0300 SCALE



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600,0.901

AMES 11-707 0A12 02A

(ABP021)

SYMBOL	MACH	PARAMETRIC VALUES		REFERENCE INFORMATION	
		ALPHA	ELEVON	SREF	SG.FT.
○	.600	20.000	10.000	LREF	39.8450
□	.901	.000	.000	BREF	39.8450
				XMRP	32.3000
				YMRP	.0000
				ZMRP	.0000
				SCALE	.0300

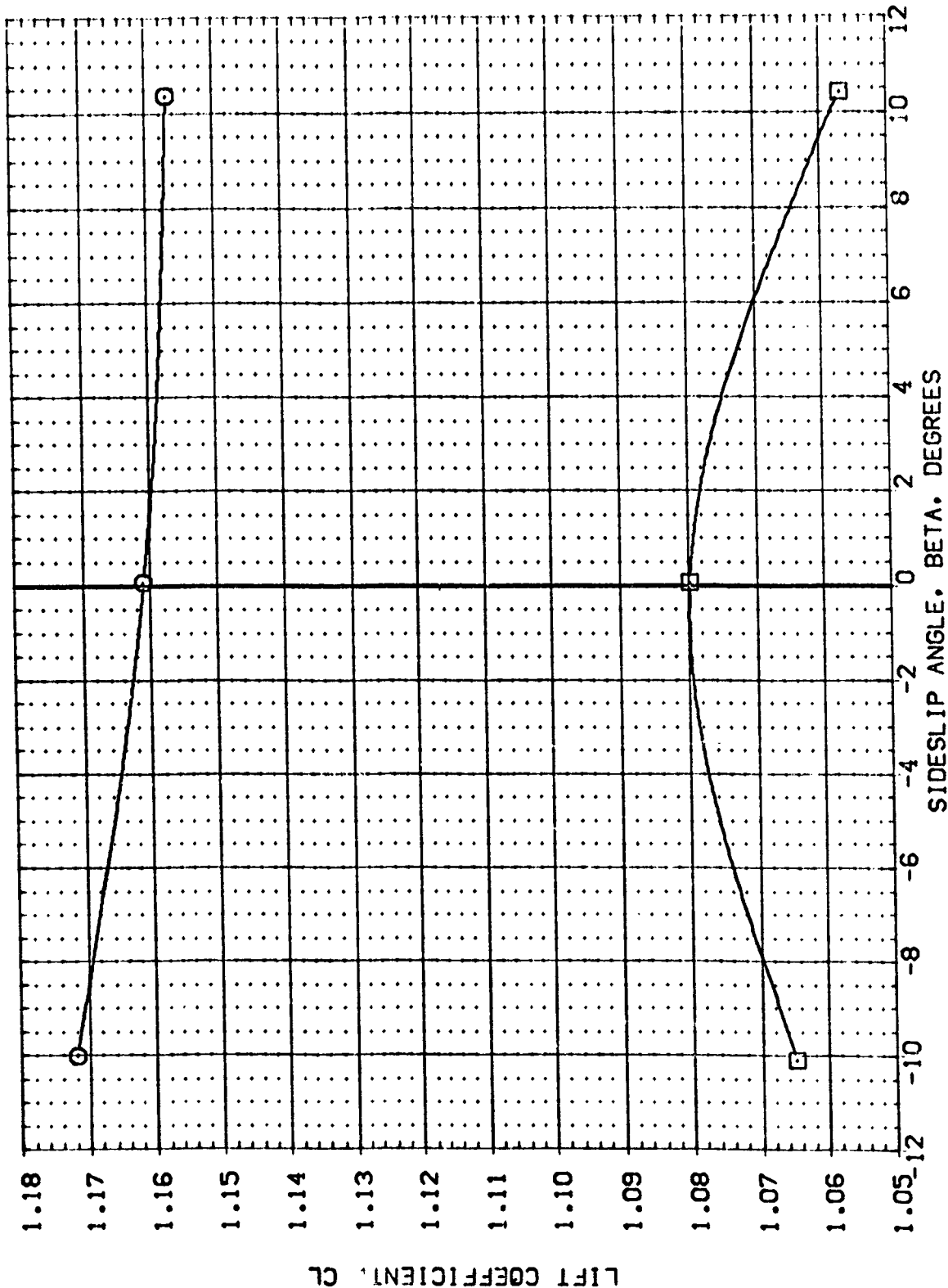


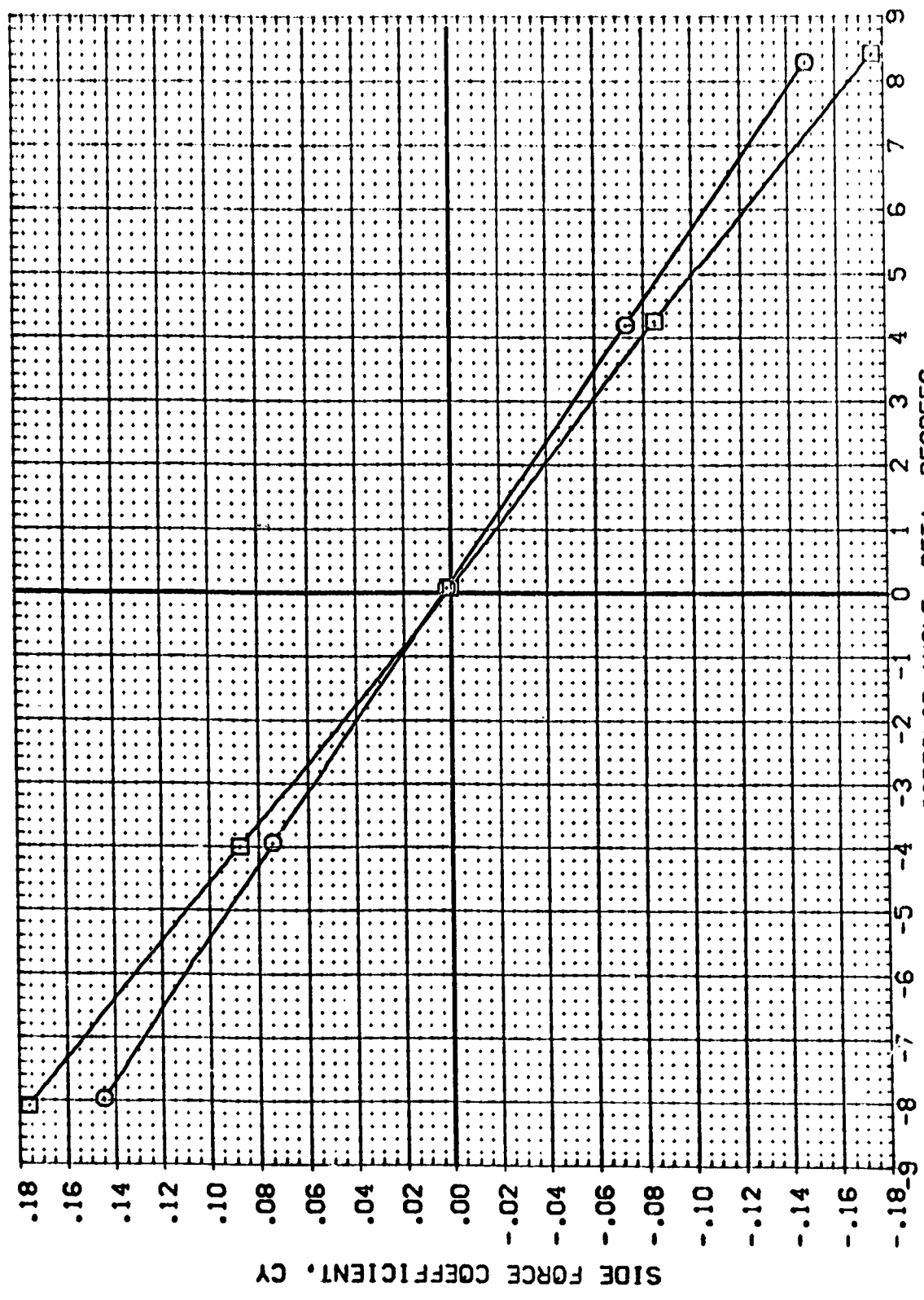
FIG.24 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=10 DEGS., MN=0.600,0.901

AMES 11-707 0A12 02A

(RBP022)

SYMBOL	MACH	PARAMETRIC VALUES		SC.FT.
	.597 .904	ALPHA RUDDER	ELEVON RUFLR	
<input type="checkbox"/>		.000	-10.000	
<input type="checkbox"/>		.000	.000	

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
BREF	39.8490
XMRP	32.3000
YMRP	.0000
ZMRP	.0000
SCALE	.0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., YN=0.597,C.904

(RBP022)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDLR
□ .597 .904 .000 .000 .000 .000

REFERENCE INFORMATION
SPEC 2.4210
LREF 38.8450
BREF 38.8450
XREF 30.3000
YREF 0.0000
ZREF 0.0000
SCALE .0300

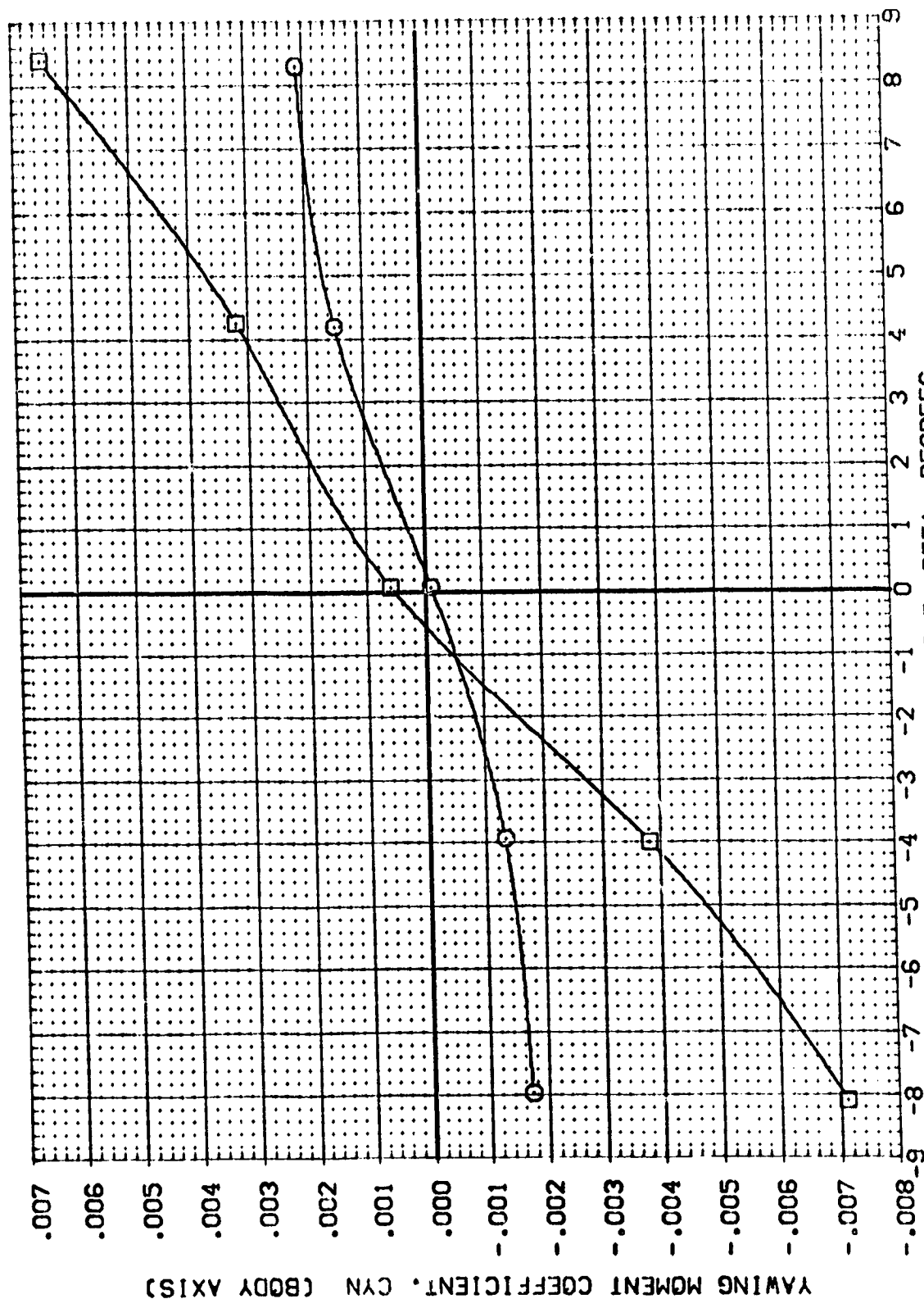


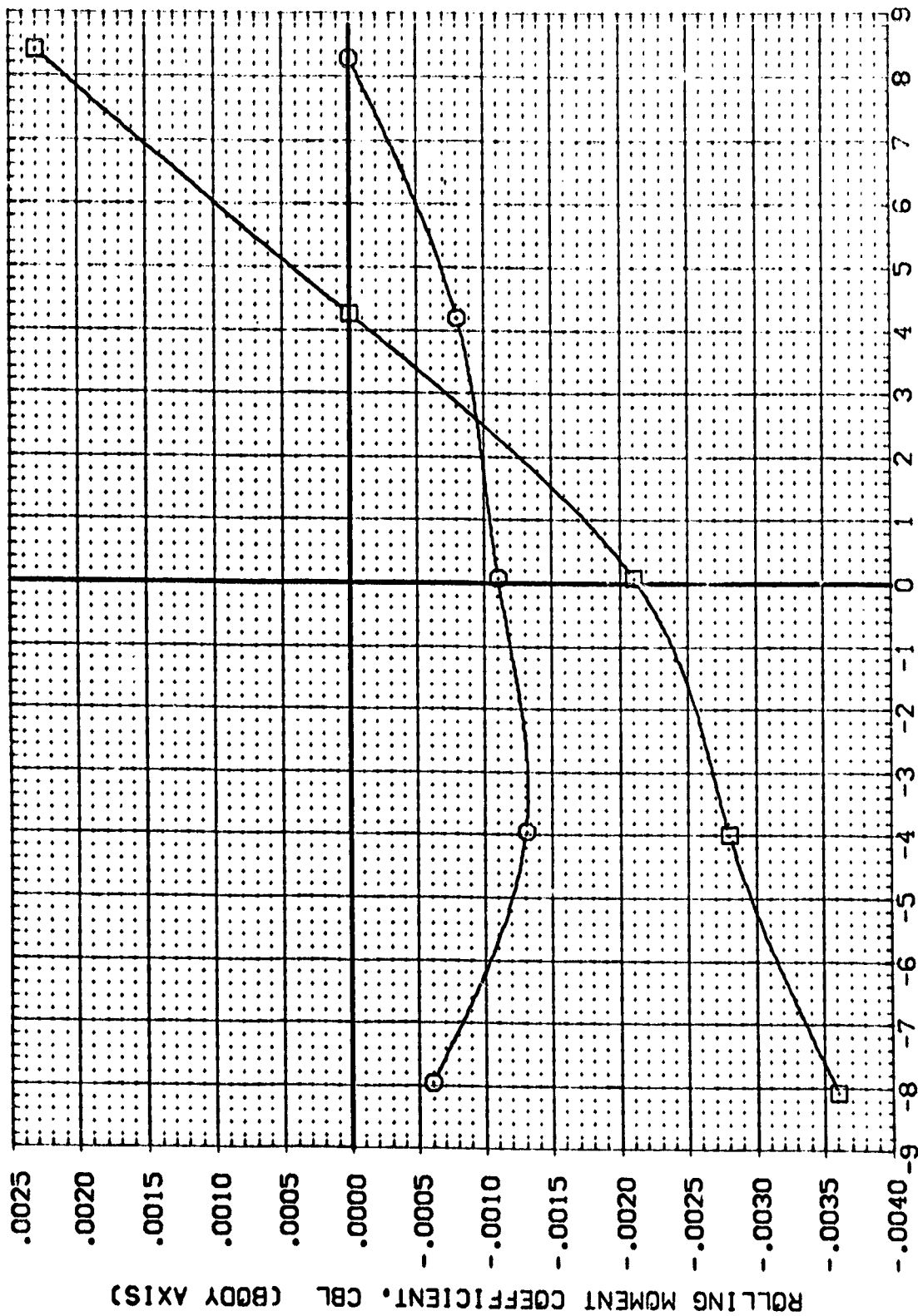
FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

AMES 11-707 0A12 02A

(RBP022)

SYMBOL	MACH	PARAMETRIC VALUES	
		ALPHA	ELEVON
○	.597	.000	-10.000
□	.904	.000	RUDFLR

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.8490
BREF	39.8490
X-REF	32.3000
Y-REF	.0000
Z-REF	.0000
SCALE	.0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., $MN=0.597, 0.904$

AMES 11-707 0A12 02A

(R8P022)

SYMBOL MACH ALPHA RUDDER
 ○ .597 .000 ELEVON -10.000
 □ .904 .000 RUDDER .000

REFERENCE INFORMATION:
 SREF 2.4210 SQ.FT.
 LREF 26.8450
 SREF 32.8450
 XREF 37.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.0000

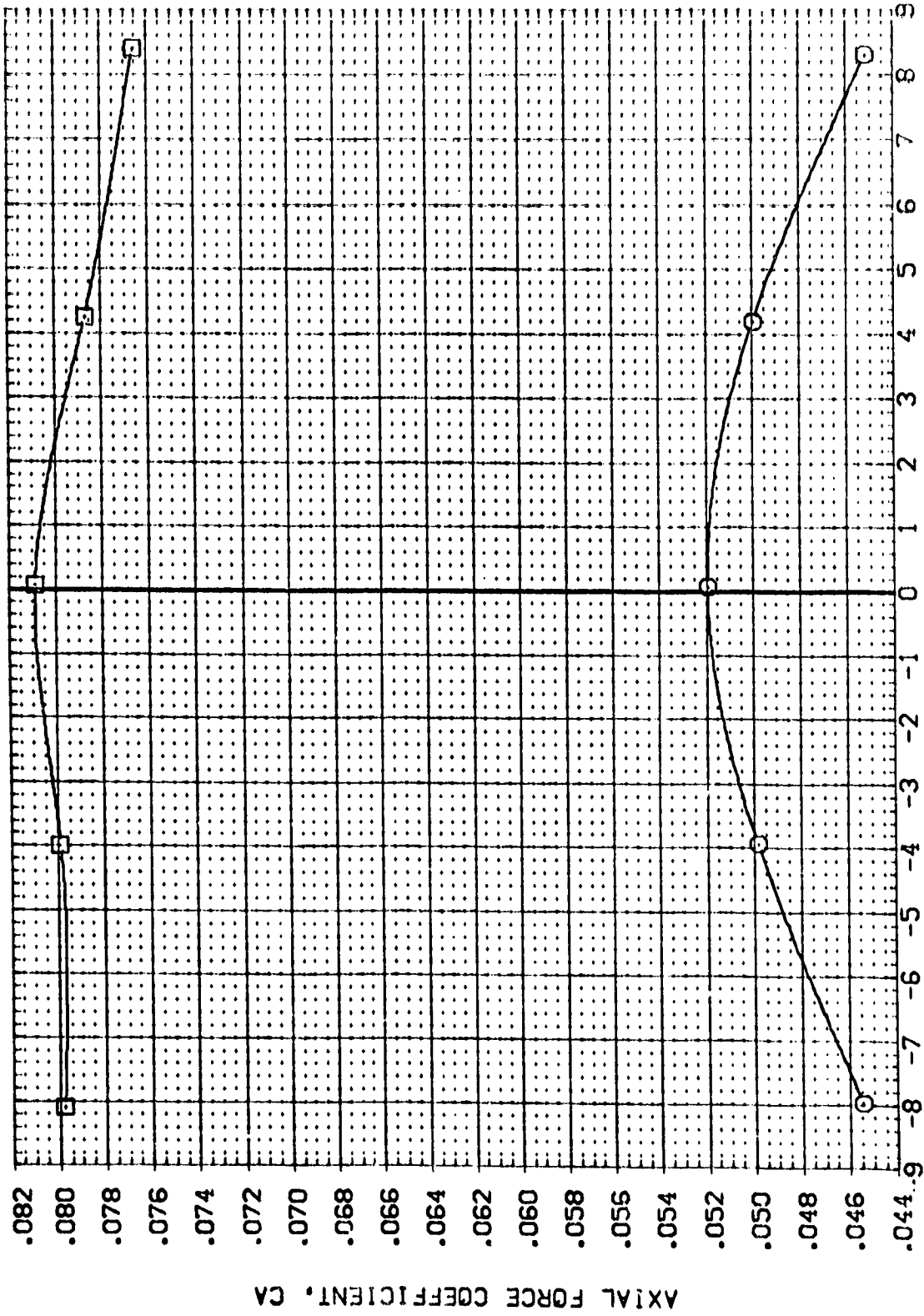


FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904



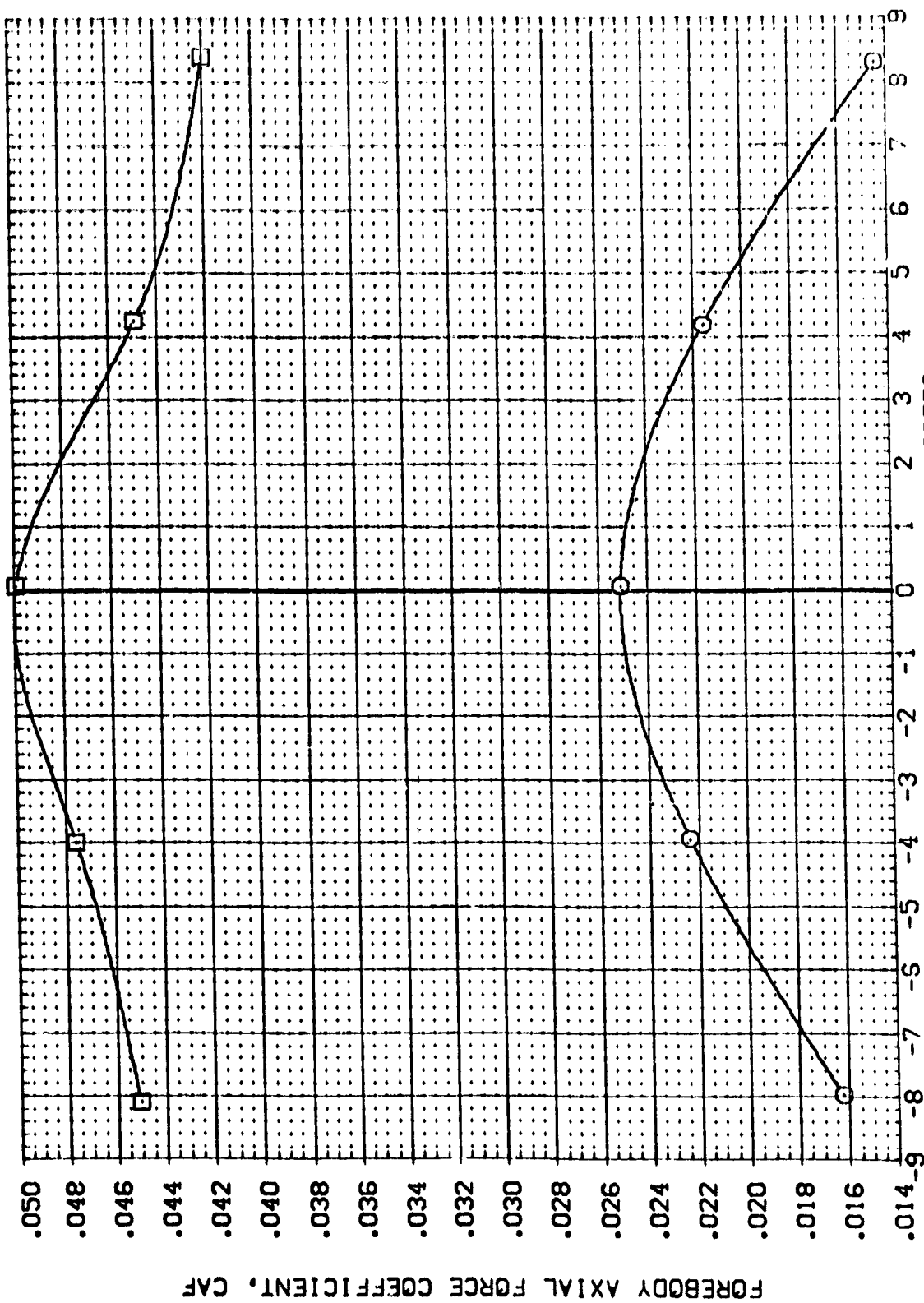
AMES 11-707 0A12 02A

(RBP022)

SYMBOL MACH ALPHA RUDDER
☐ .597 .000 .000
☐ .904 .000 .000

PARAMETRIC VALUES
 ELEVON -10.000
 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .030



SIDESLIP ANGLE, BETA, DEGREES

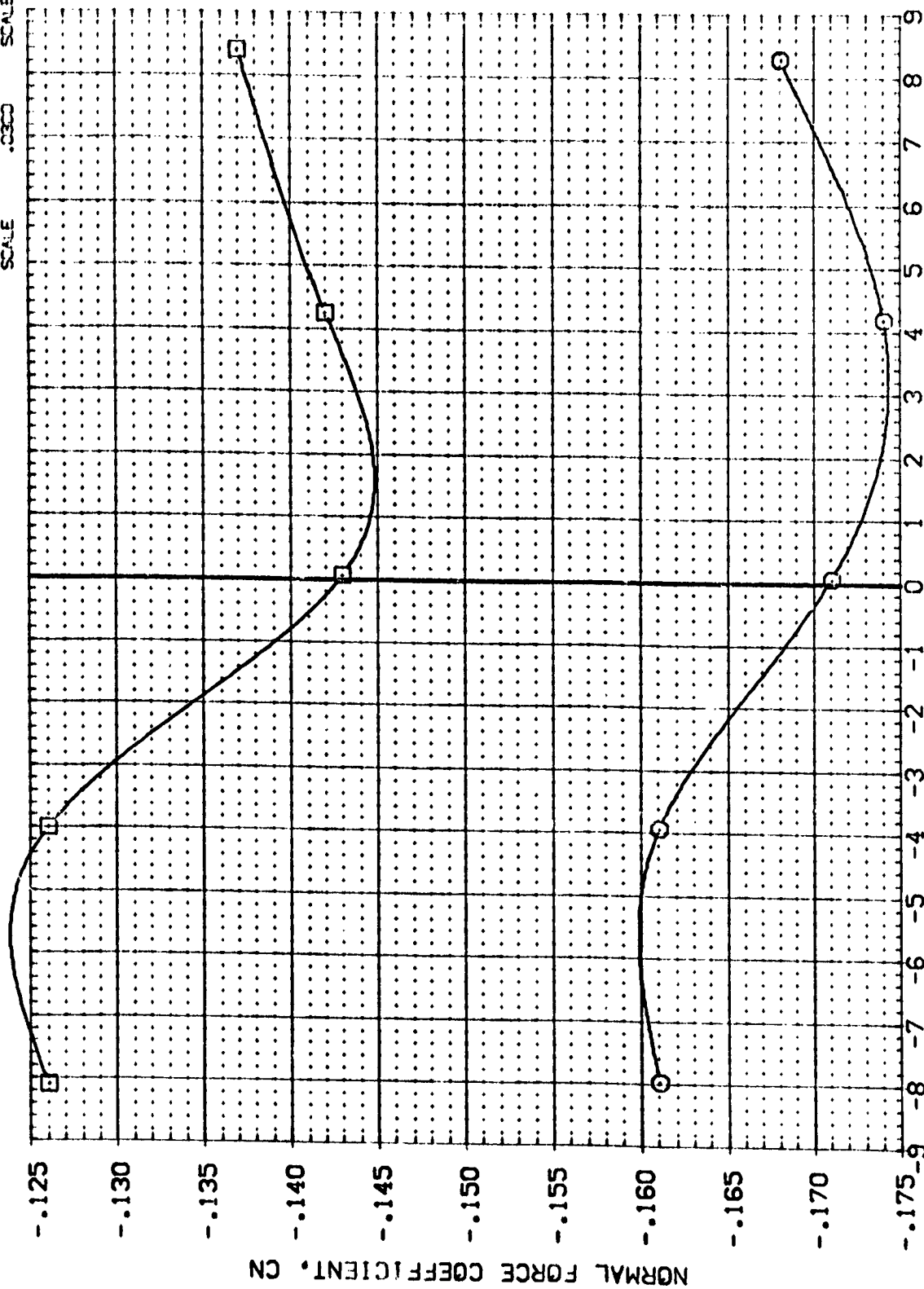
FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., YN=0.597, 0.904

AMES 11-707 0A12 02A

(RBP022)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON -10.000 RUGFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8490
BREF 38.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597,0.904



AMES 11-707 0A12 02A

(RBP022)

SYMBOL	MACH	PARAMETRIC VALUES		REFERENCE INFORMATION	
		ALPHA	ELEVON	SREF	SQ.FT.
□	.597	RUDDER	-10.000	LREF	IN.
	.904			BREF	IN.
				XMRP	IN.
				YMRP	IN.
				ZMRP	IN.
				SCALE	SCALE

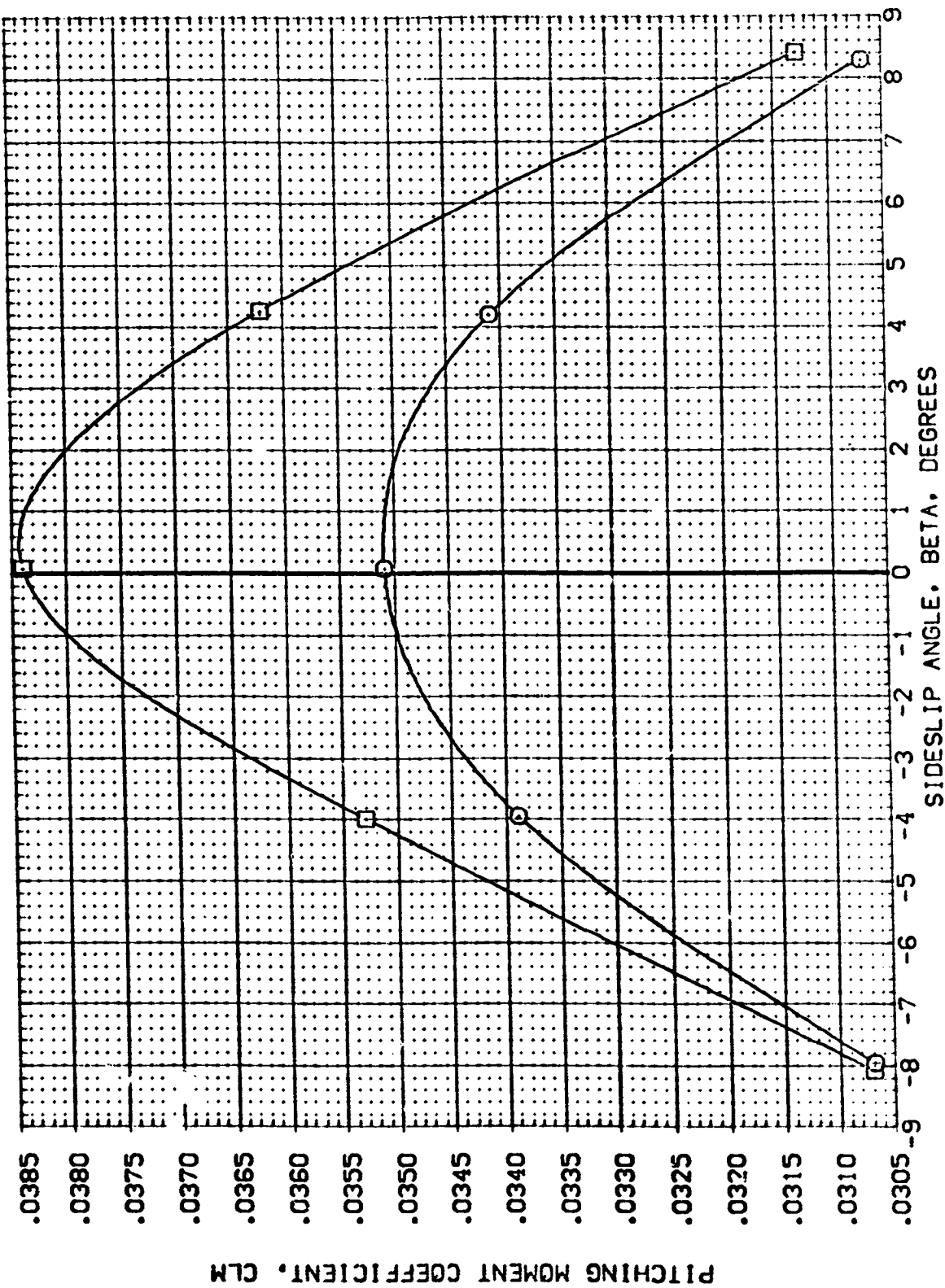


FIG.25 ORBITER LAT-OIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597,0.904

(RBP022)

AMES : 1-707 GA12 C2A

SYMBOL MACH ALPHA RUDDER

PARAMETRIC VALUES

ELEVON -10.000

RUDFLR .000

REFERENCE INFORMATION

SREF 2.4210 SQ.FT.

LREF 38.8490 IN.

BREF 38.8490 IN.

XVRP 32.3000 IN.

YVRP .0000 IN.

ZVRP .0000 IN.

SCALE .0300

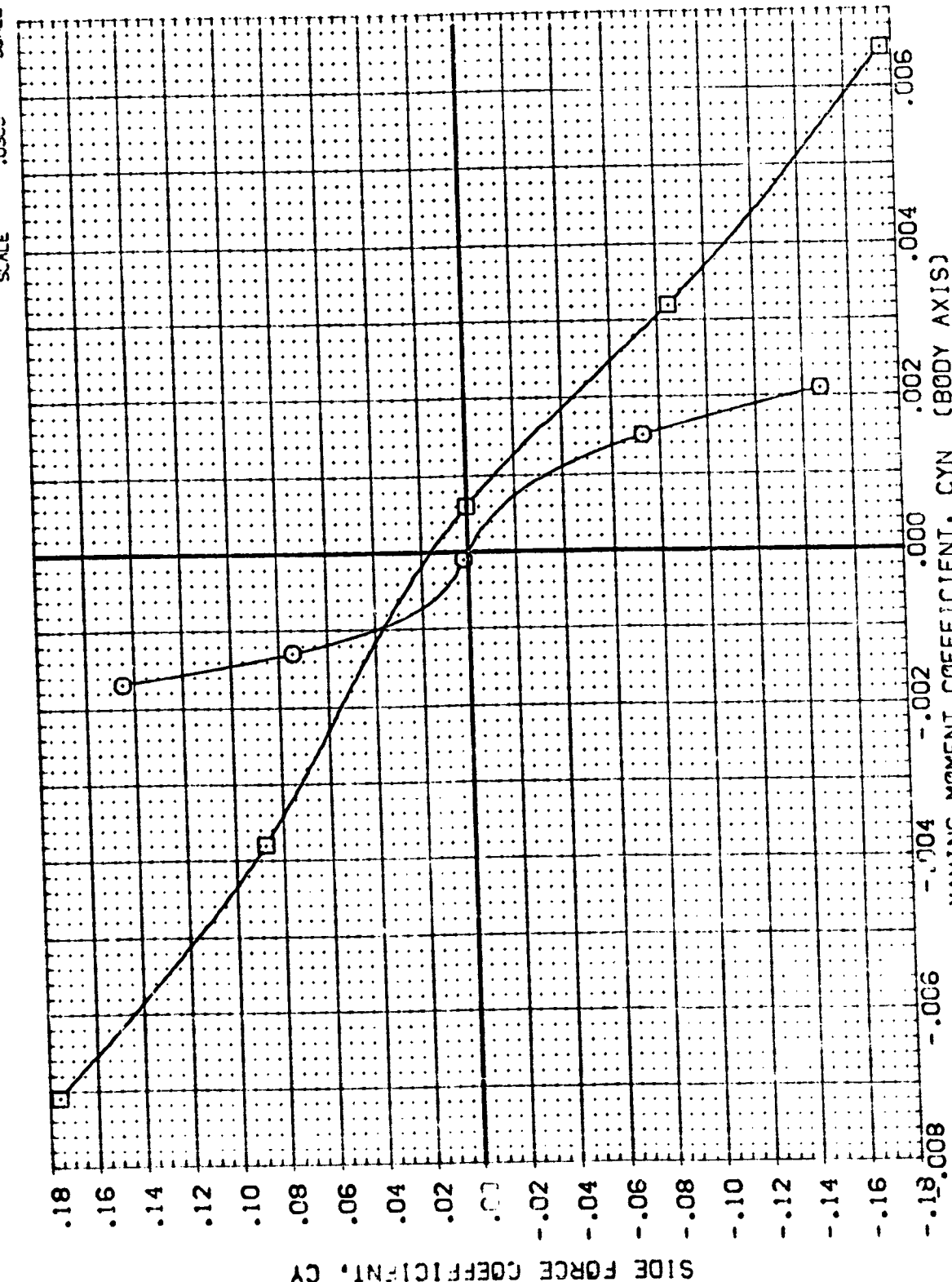


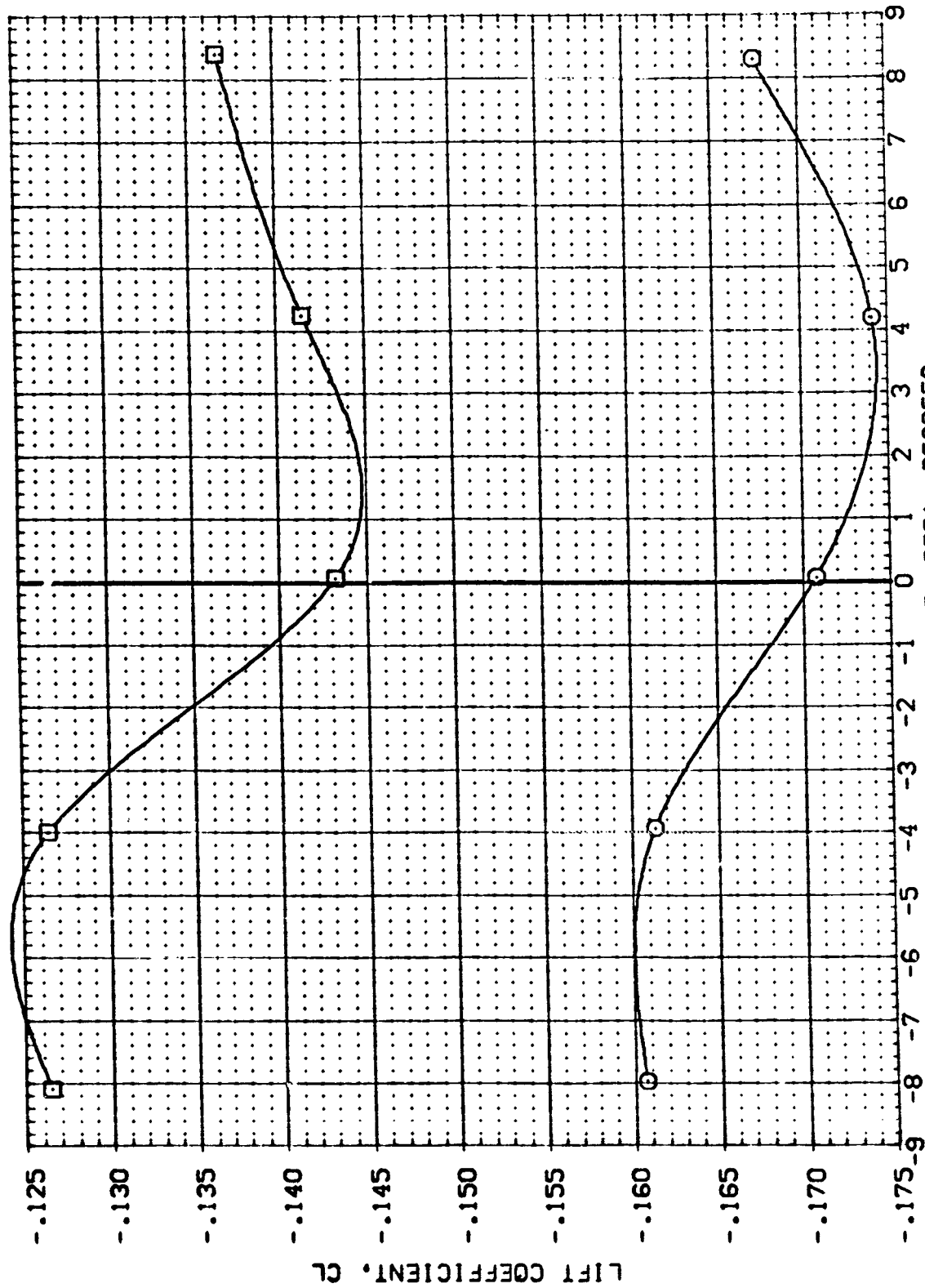
FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904



AMES 11-707 0A12 02A

(ABP022)

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
		ALPHA	ELEVON	RUDFLR	SREF	SO.FT.	
□	.537		.000	-10.000	LREF	39.8490	IN.
□	.904	RUDR	.000	.000	BREF	39.8490	IN.
					XMRP	32.3000	IN.
					YMRP	.0000	IN.
					ZMRP	.0000	IN.
					SCALE	.0300	SCALE



SIDESLIP ANGLE, BETA, DEGREES

FIG.25 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-10 DEGS., MN=0.597,0.904

AMES 11-707 0A12 02A

(RBP023)

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8450 IN.
 BREF 38.8450 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

SYMBOL MACH ALPHA RUDDER
 ○ .598
 □ .000

PARAMETRIC VALUES
 5.000 ELEVON
 .000 RUDDLR
 -10.000

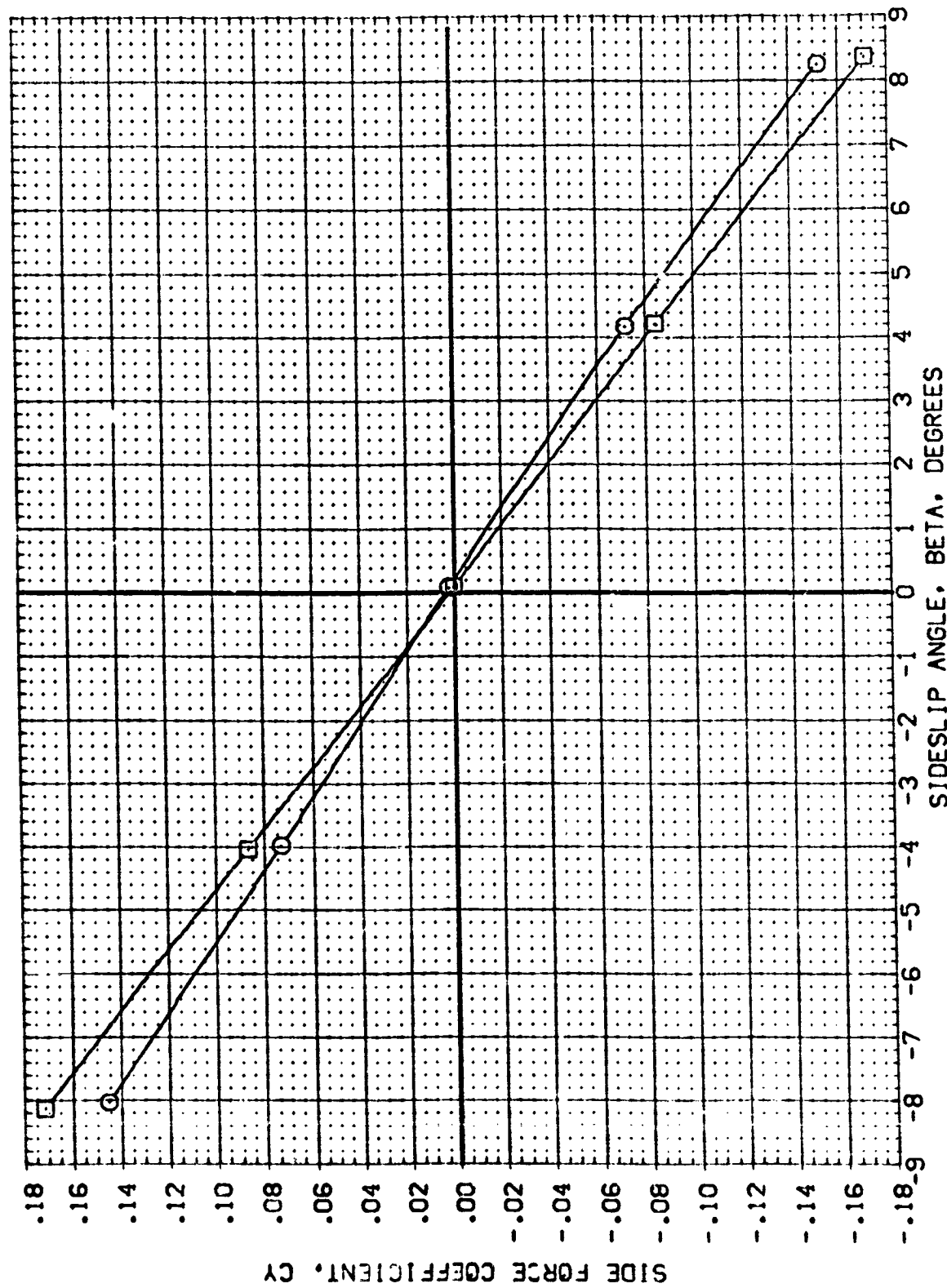


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901



AMES 11-707 0A12 02A

(RBP023)

SYMBOL	MACH	PARAMETRIC VALUES			SQ.FT.
		ALPHA	ELEVON	RUDFLR	
□	.598		-10.000	.000	2.4210
○	.901				38.8450
					38.8450
					32.3000
					.0000
					.0000
					.0300
					SCALE

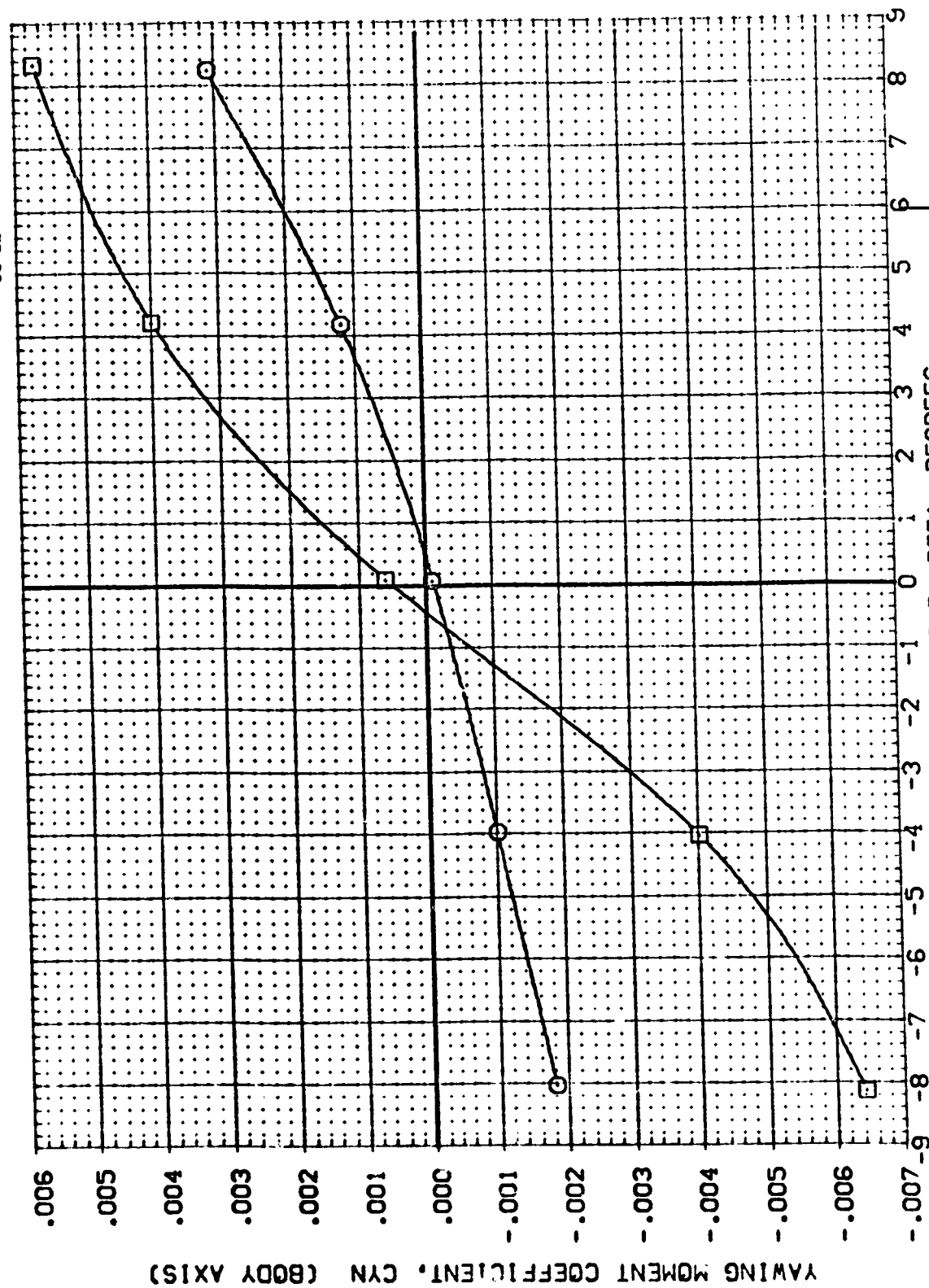


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901

(RBP023)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
598 .598 .901 5.000 .000 .000 ELEVON RUDDER
-10.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

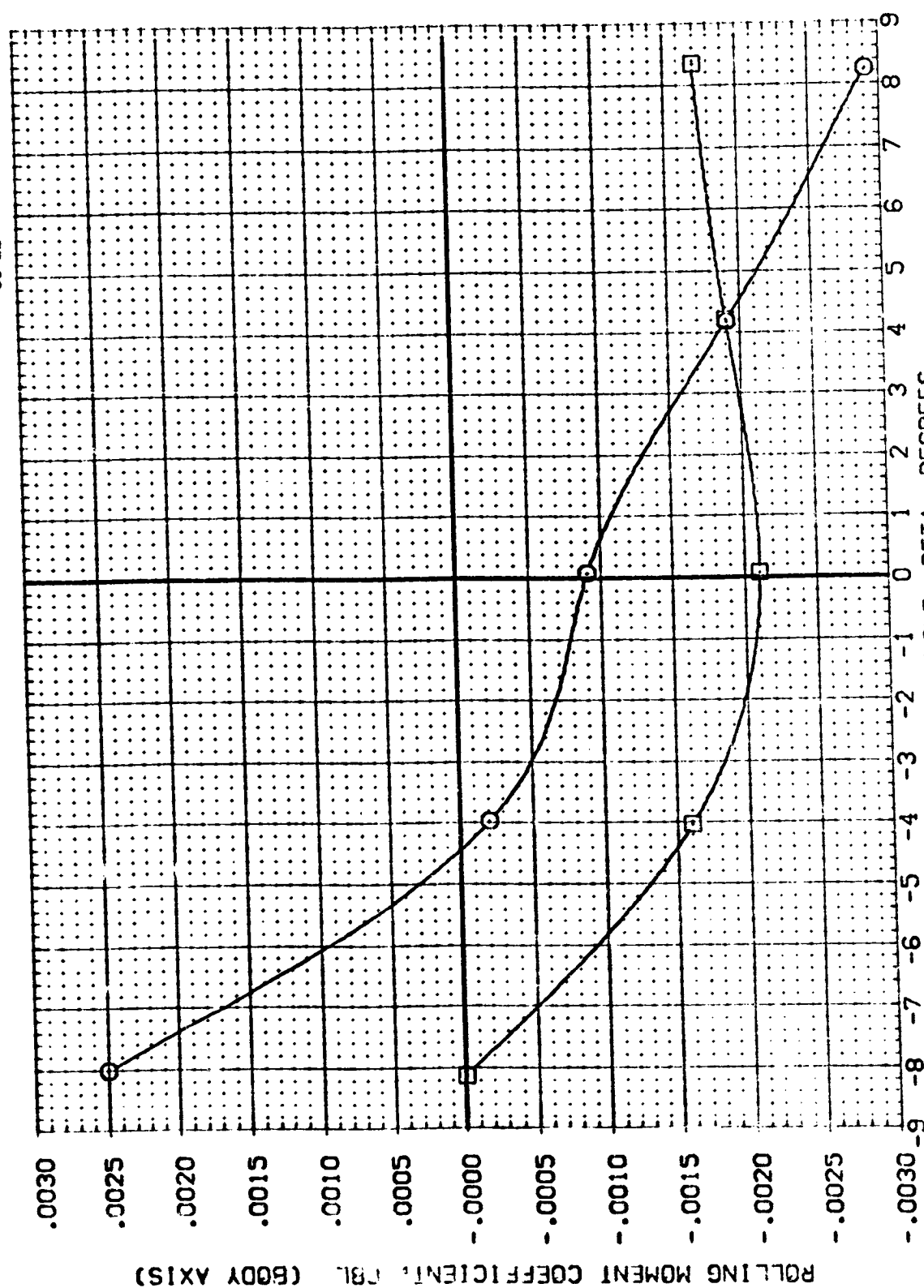


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901
PAGE 200

SYMBOL	MACH	PARAMETRIC VALUES
□	.598	ALPHA 5.000 ELEVON
□	.901	FLUDDER .000 RUFLER

(RBP023)

REFERENCE INFORMATION		SC.FT.
SREF	2.4210	IN.
LREF	39.8490	IN.
BREF	39.8490	IN.
X-RP	32.3000	IN.
Y-RP	.0000	IN.
Z-RP	.0000	IN.
SCALE	.0000	SCALE

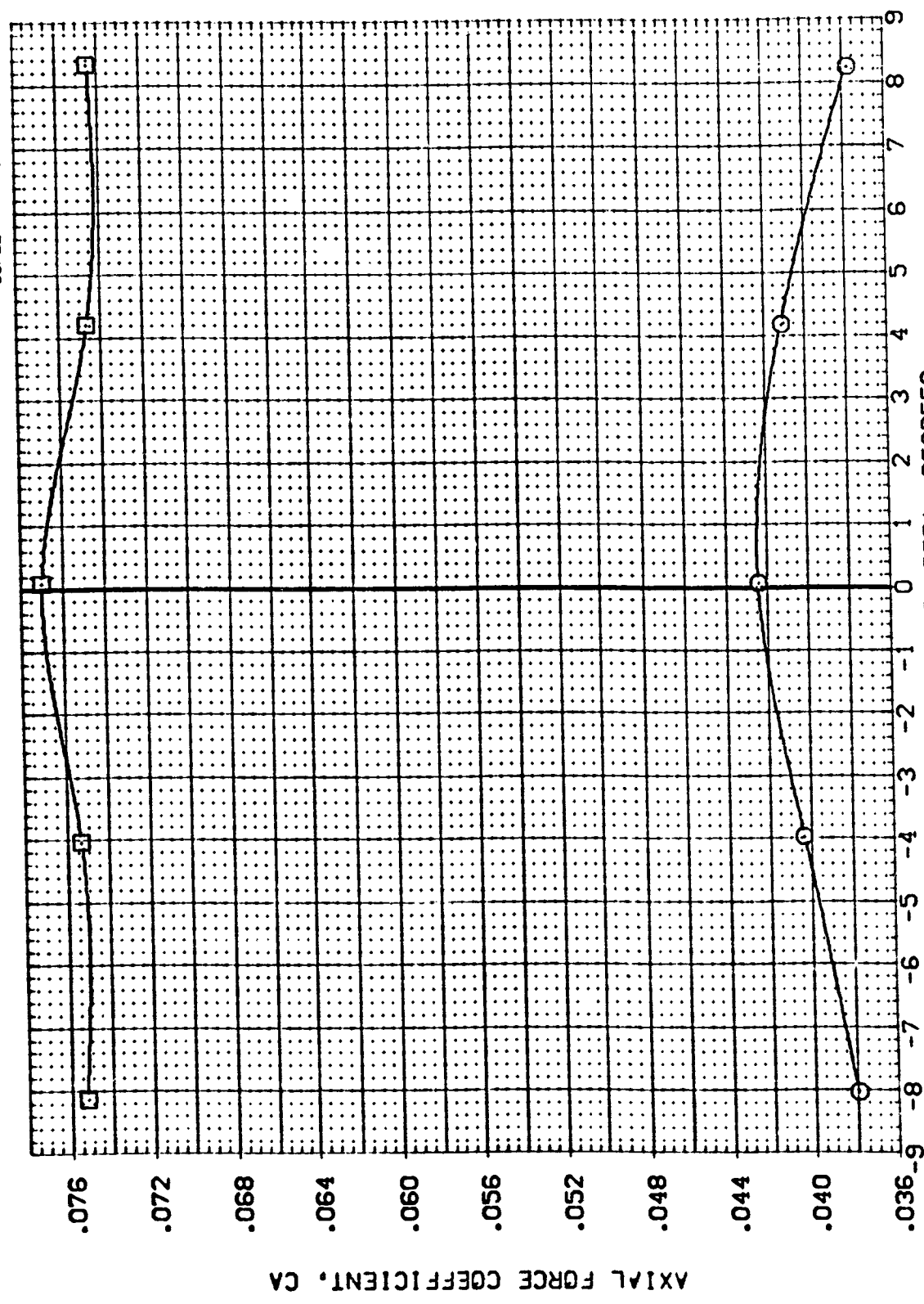


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901

AMES 11-707 OA:2 02A

(RBP023)

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 XMRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

PARAMETRIC VALUES
 MACH .598 ALPHA 5.000 ELEVON -10.000
 .901 RUDDER .000 RUOFLR .000

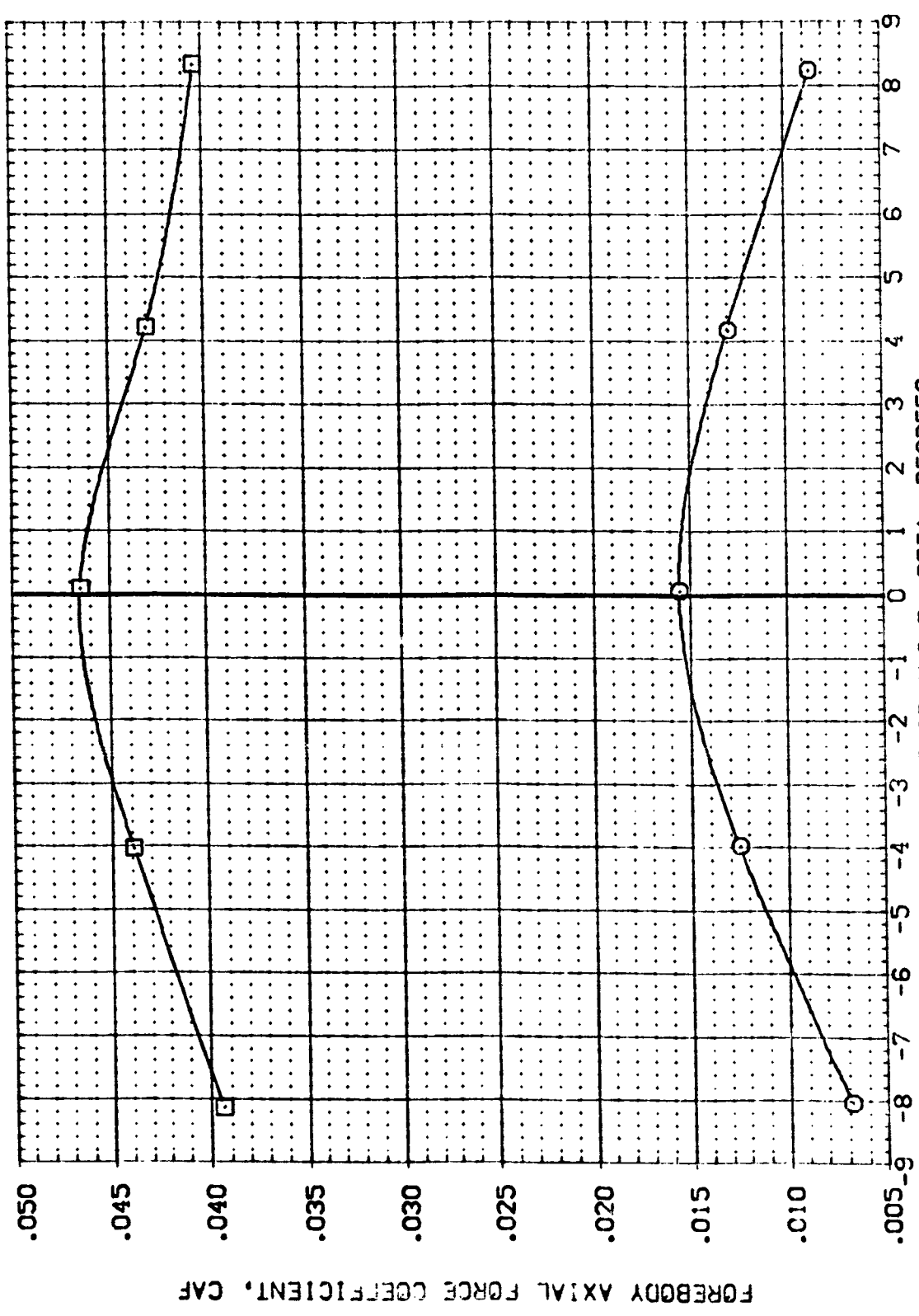


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901



AMES 11-707 GA:2 02A

(RBP023)

SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
		ALPHA	ELEVON	-10.000	SREF	2.4210	50.FT.
□	.901	RUDDER	RJFLR	.000	LREF	29.8490	IN.
					BREF	39.8490	IN.
					VMRP	32.3000	IN.
					VMRP	.0000	IN.
					VMRP	.0000	IN.
					SCALE	.0300	SCALE

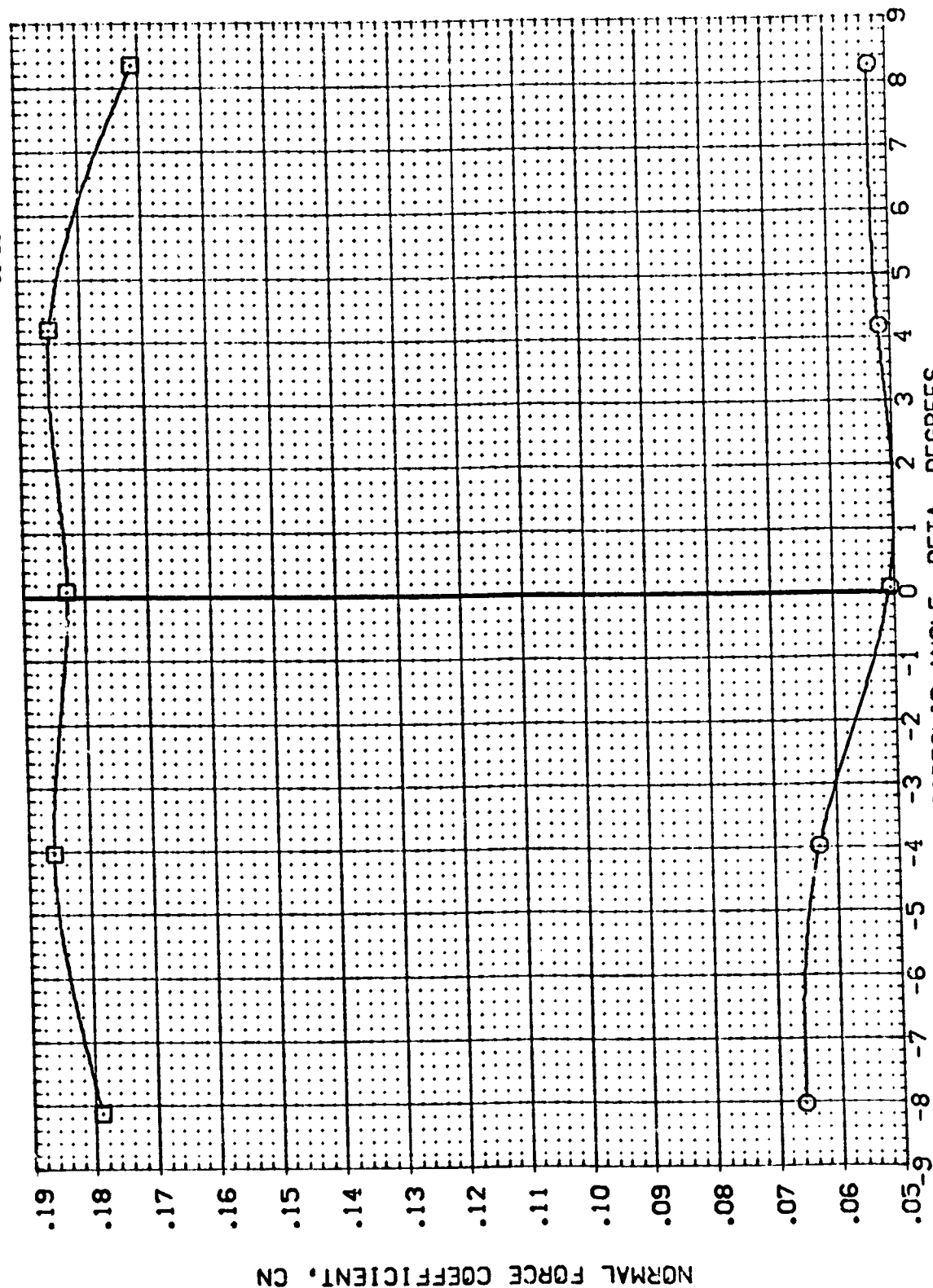


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901
PAGES 203

(RBP023)

AMES 11-707 0A12 02A

SYNCH. MACH .598 ALPHA .901
 PARAMETRIC VALUES
 5.000 ELEVON -10.000
 .000 RUDDER .000

REFERENCE INFORMATION
 SPREF 2.4210 SQ.FT.
 LREF 38.8480
 BRREF 38.8480
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

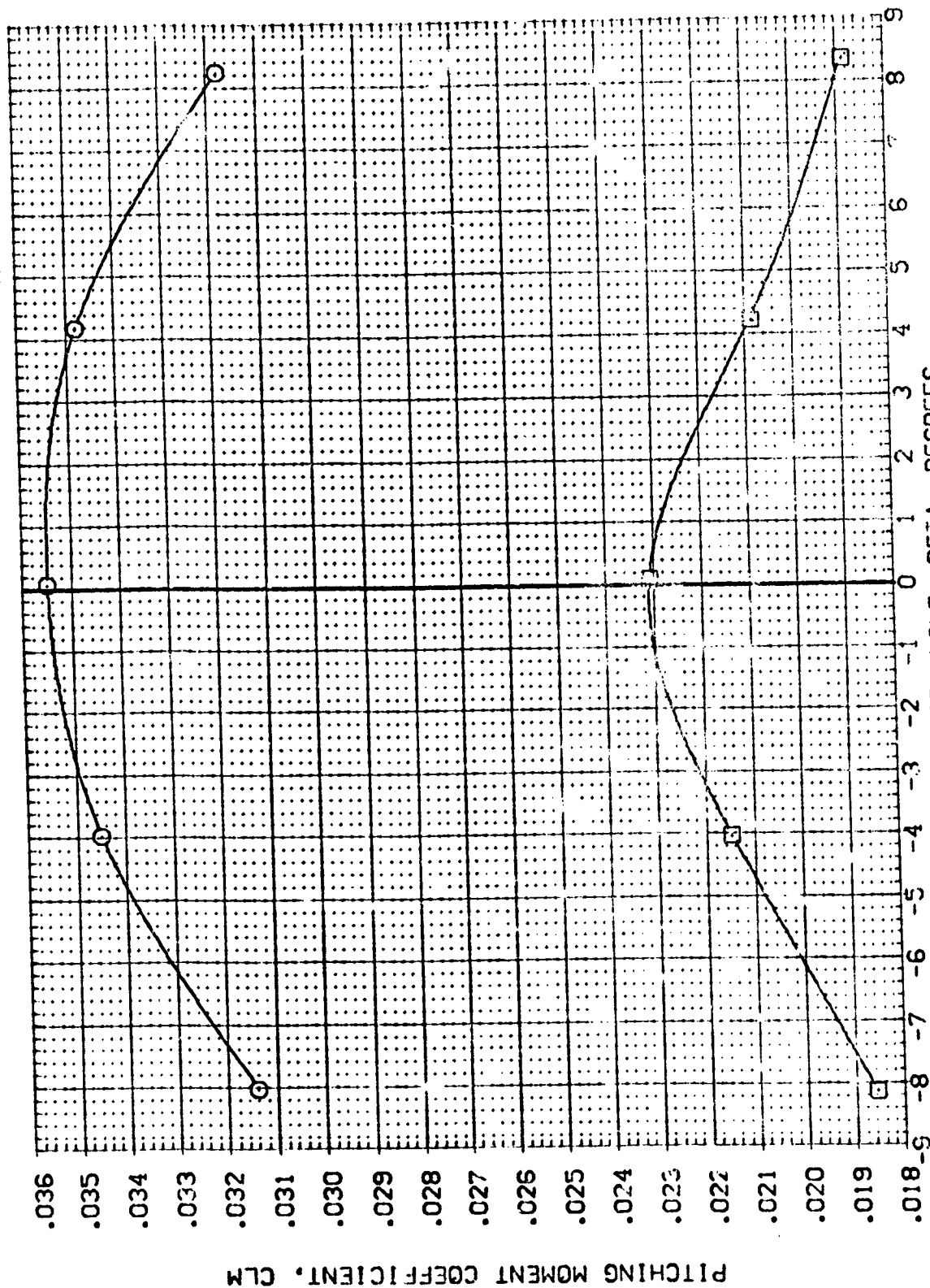


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598, 0.901

AMES 11-707 0A12 02A

(RBP023)

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.598	.901		5.000 ELEVON -10.000	SREF 2.4210 SQ.FT.
○				.000 RUOFLR .000	LREF 39.8450 N.
					BREF 39.8450 N.
					XMREF 32.5000 N.
					YMREF 32.5000 N.
					ZMREF 32.5000 N.
					SCALE .0300

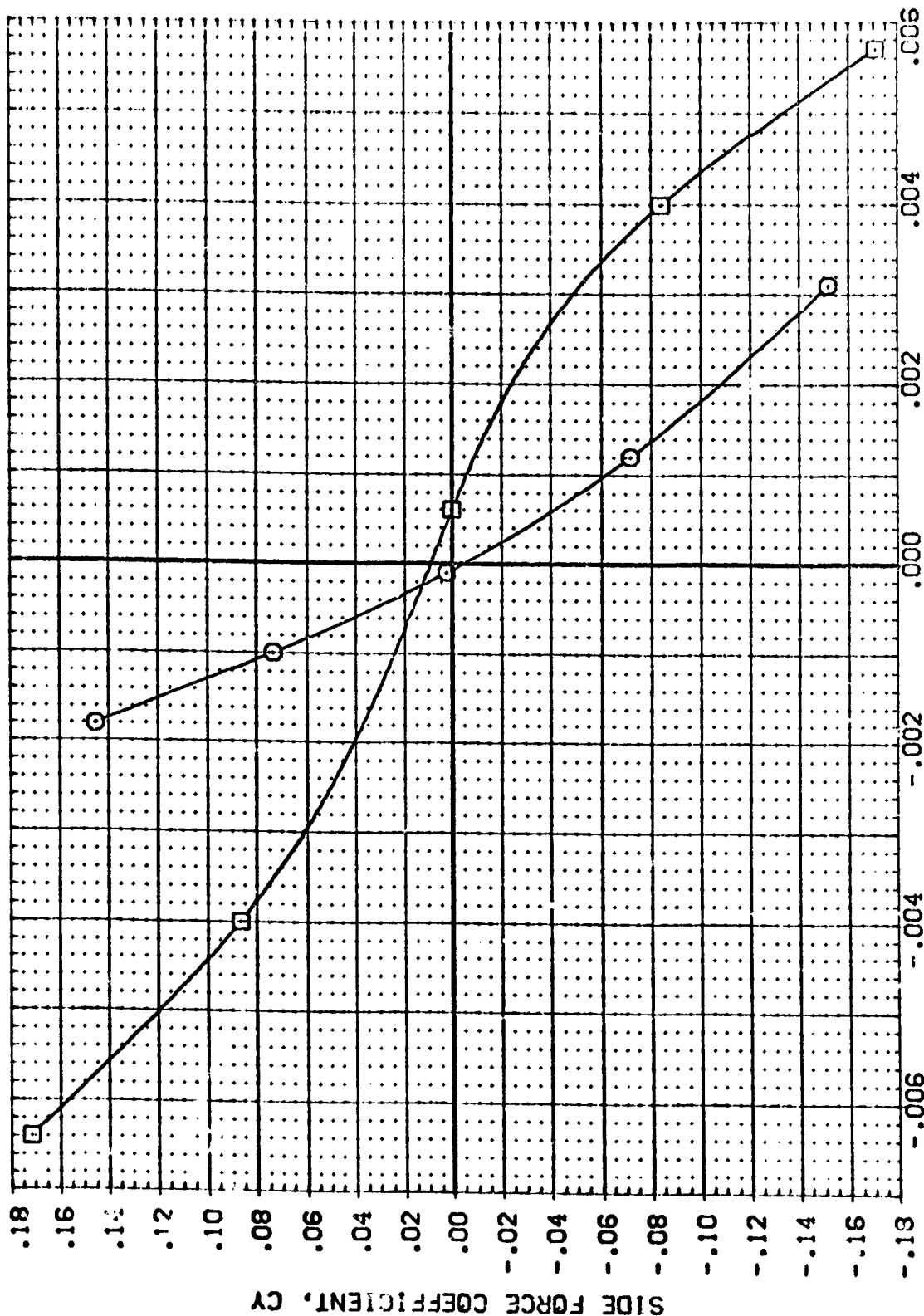


FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., MN=0.598,0.901

(ABP023)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDEL ELEVON RUDEL ELEVON

0.952

0.001

0.000

0.000

-10.000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.9150
BREF 32.8150
XMRP 32.5000
YMRP 0.0000
ZMRP 0.0000
SCALE 1.0000

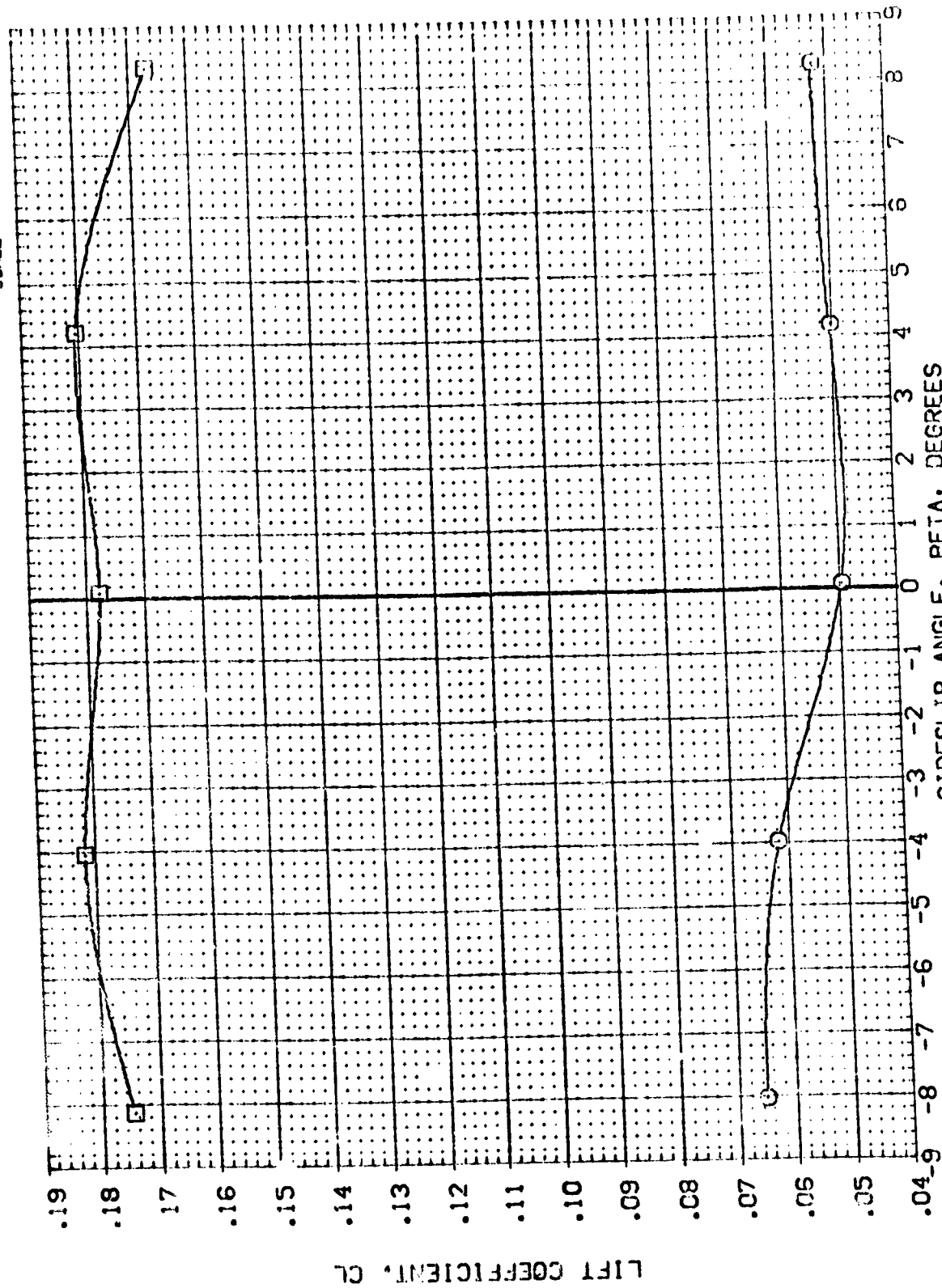


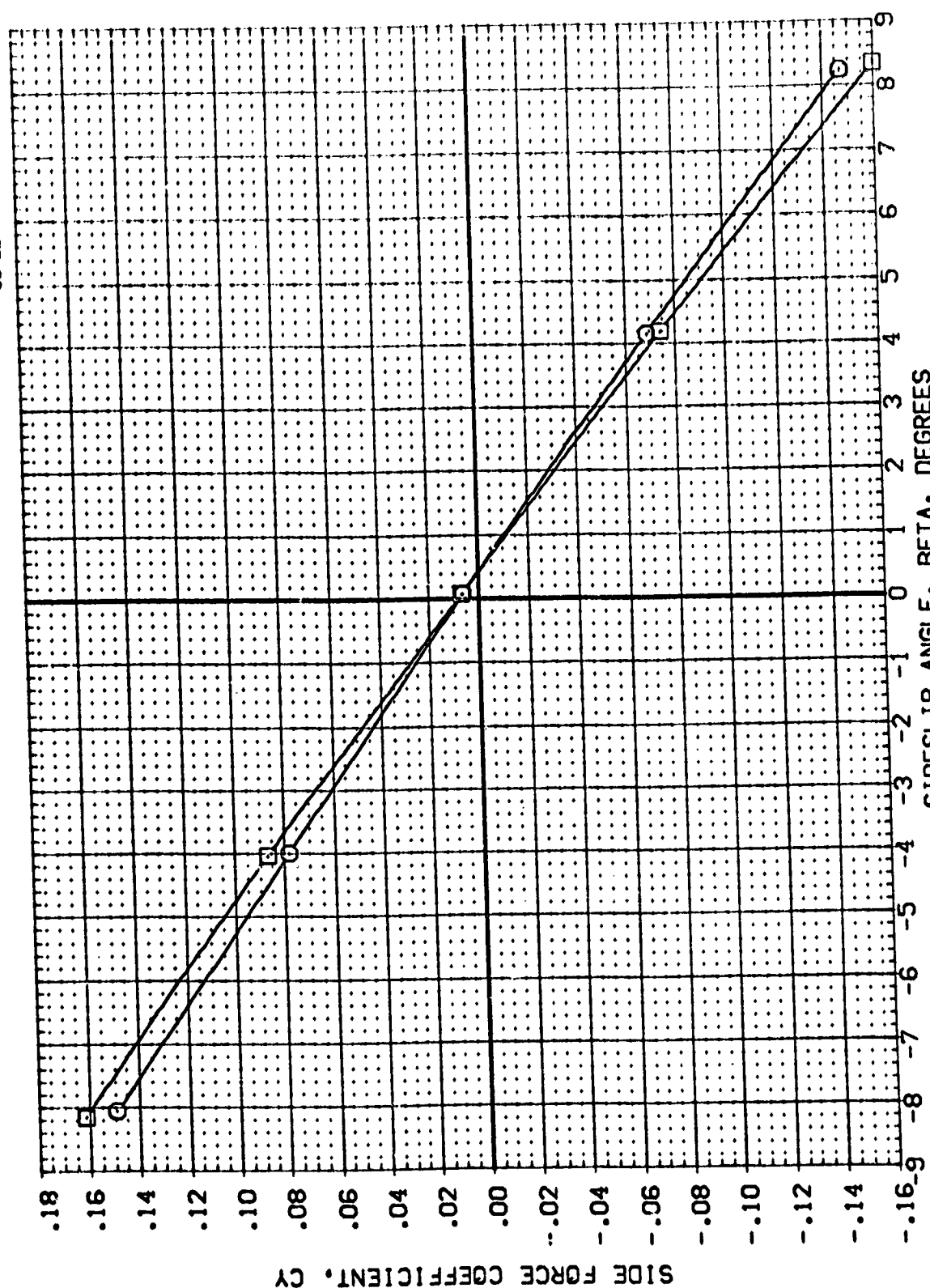
FIG.26 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-10 DEGS., YW=0.598, 0.901

(RBP024)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR
 .599 .000 .000 .000
 .900 .000 .000 .000

REFERENCE INFORMATION
 SPEC 2.4210 SQ.FT.
 LREF 38.8490
 BREF 38.8490
 XGRP 32.3000
 YGRP .0000
 ZGRP .0000
 SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599, 0.900

(RBP024)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .599 .000
□ .900 .000

PARAMETRIC VALUES
10.000 ELEVON -10.000
.000 RUDFLR .000

REFERENCE INFORMATION
SREF 2.4212
LREF 38.8450
BREF 38.8450
VREF 32.3000
WREF 1.0000
TREF 1.0000
SCALE .0001

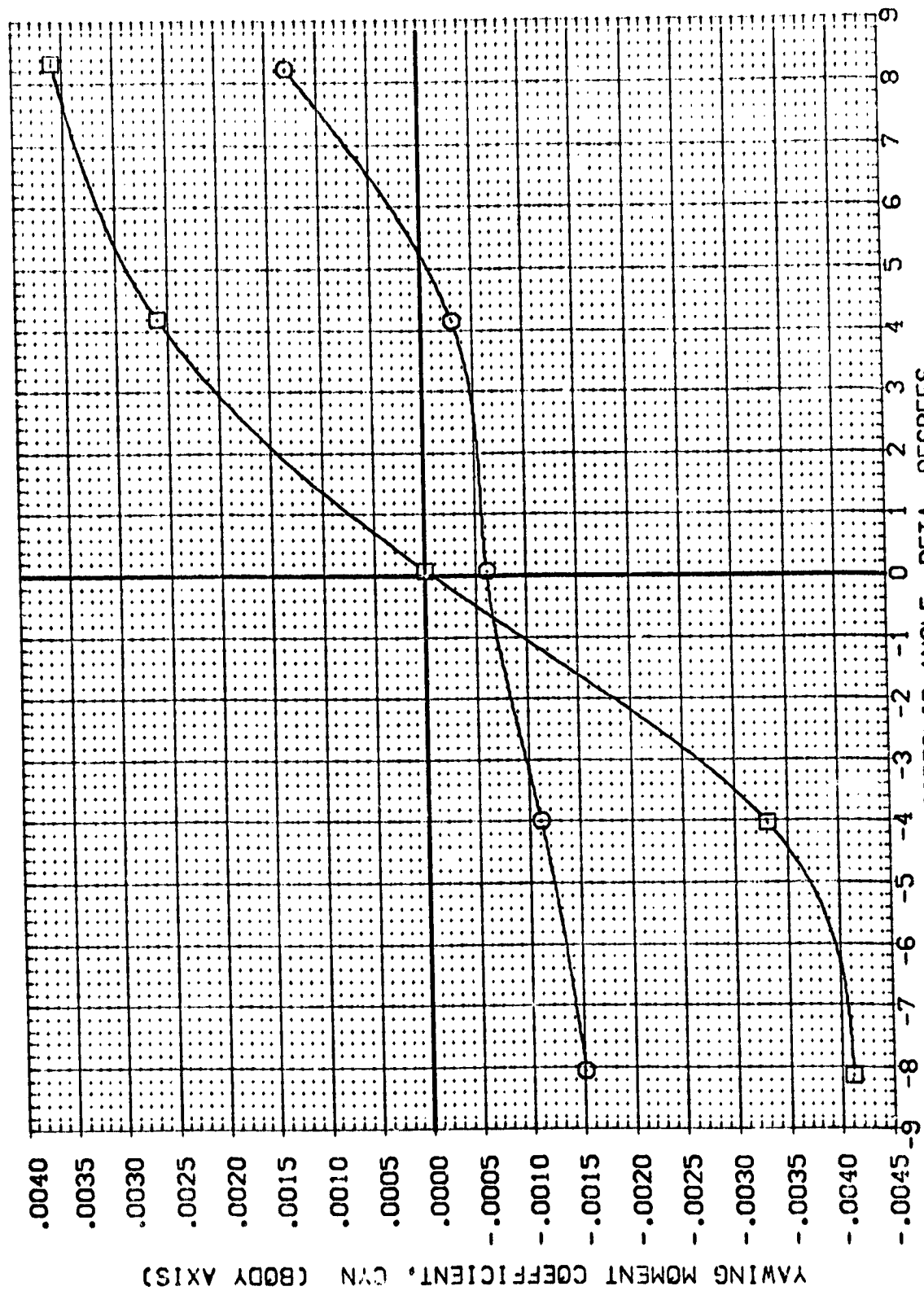


FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900
PAGE 208



(RBP024)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	RUDDER	PARAMETRIC VALUES	SC.FT.
□	.599	10.000	.000	ELEVON	2.4210
○	.900	.000	-10.000	RUDDLR	39.8490

REFERENCE INFORMATION

SREF	2.4210
LREF	39.8490
BREF	39.8490
XMRP	32.3000
YMRP	.0000
ZMRP	.0000
SCALE	.0300

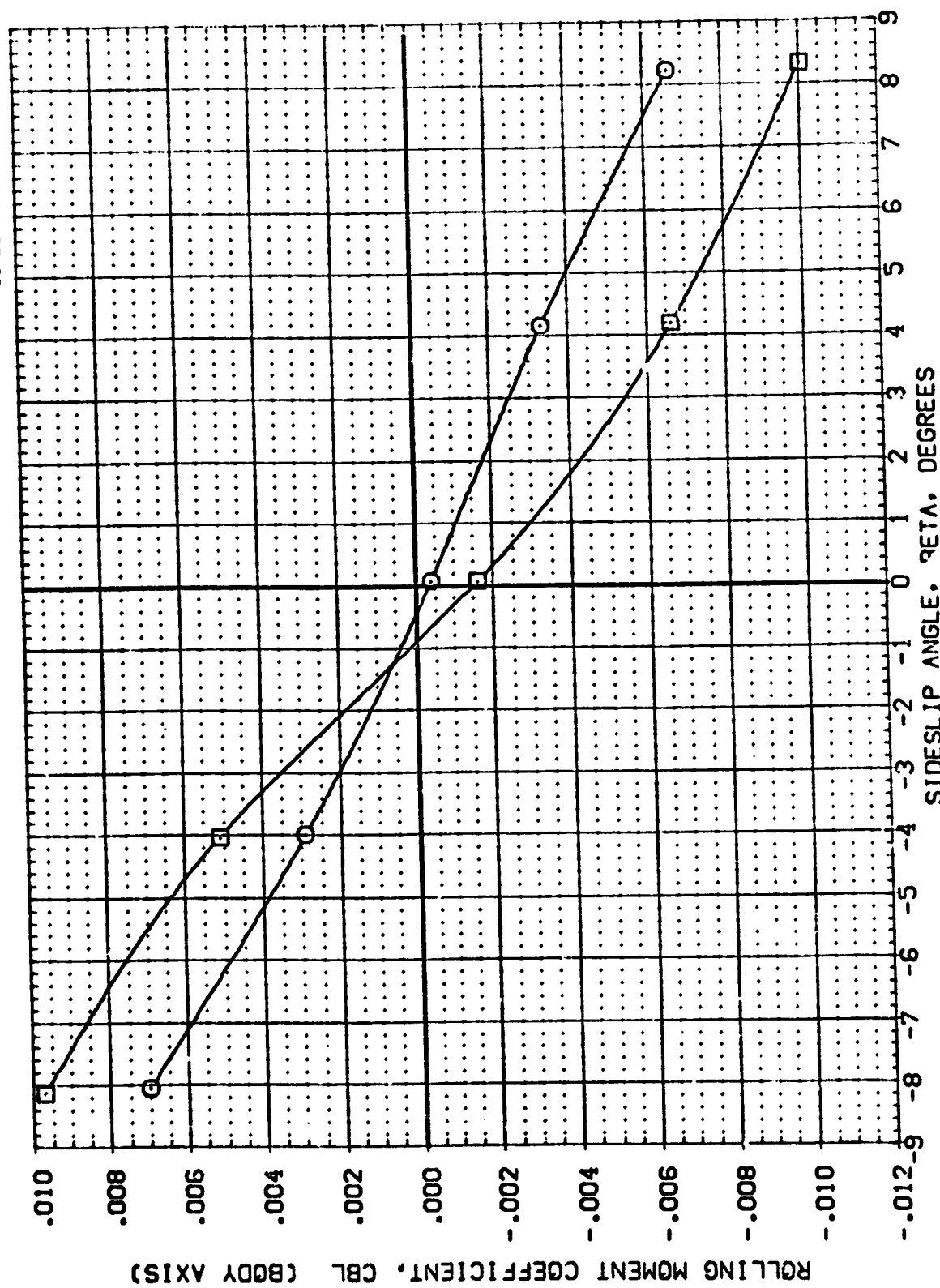


FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900

(RBP024)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
○ .599
□ .900

PARAMETRIC VALUES
10.000 ELEVON -10.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

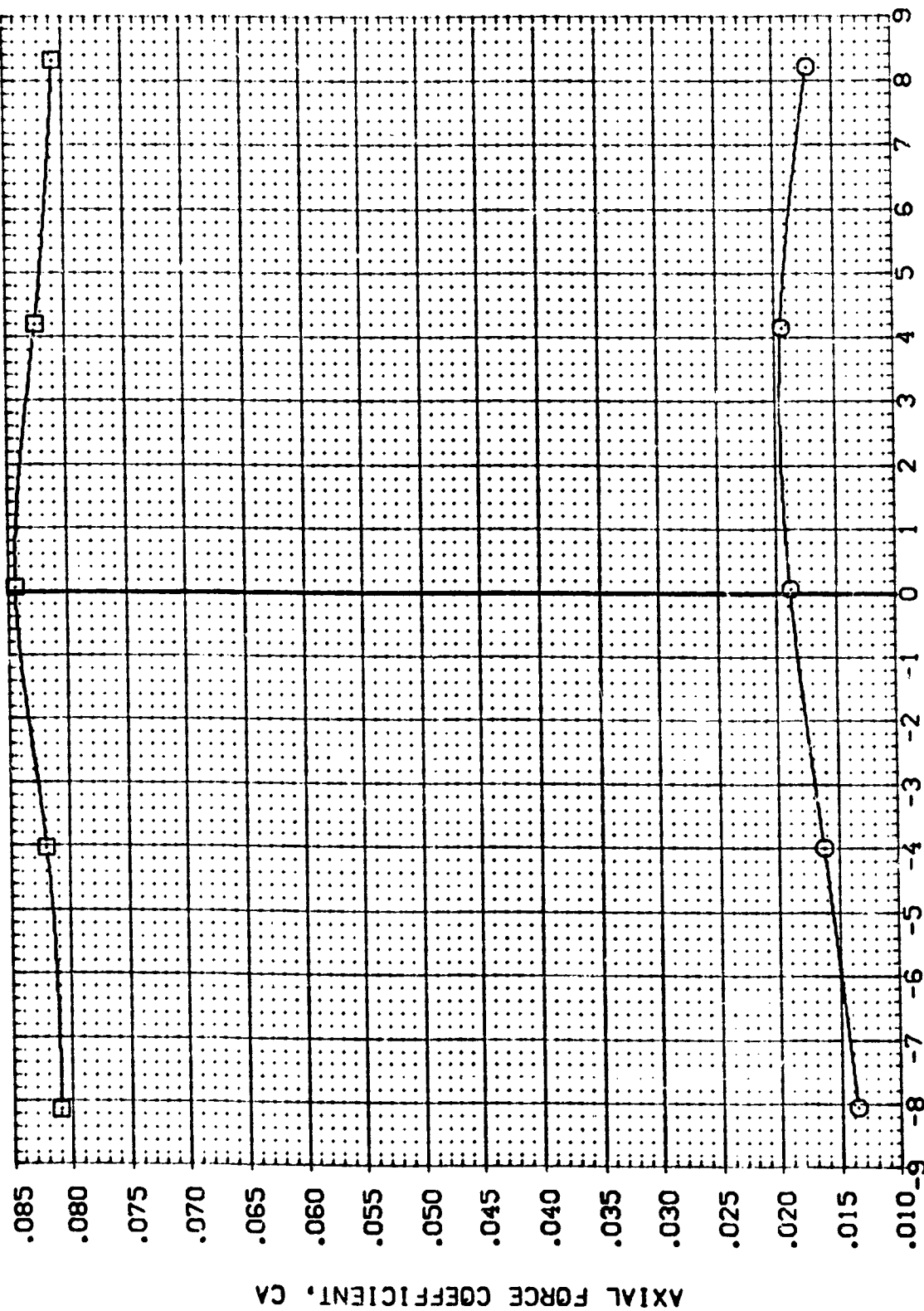


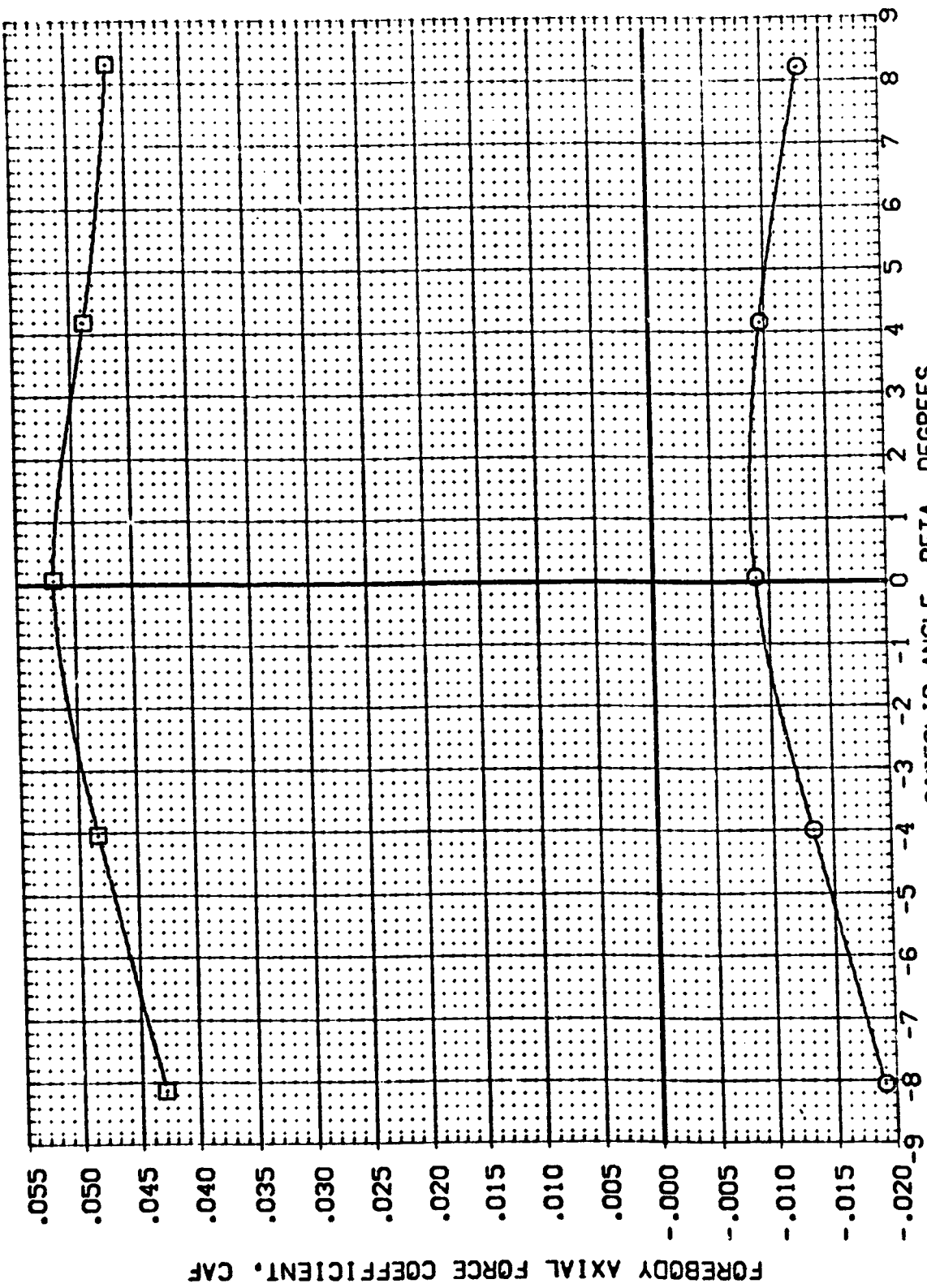
FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900

(RBP024)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 □ .599 .900
 □ .000 .000
 □ .000 .000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 39.849C
 BREF 39.849C
 XMRP 32.300C
 YMRP 10.000C
 ZMRP 10.000C
 SCALE .0001



SIDESLIP ANGLE, BETA, DEGREES

FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900

≡

AMES 11-707 0A12 02A

(RBP024)

SYMBOL □

MACH .599
.900

ALPHA RUDER

PARAMETRIC VALUES
10.000 ELEVON -10.000
.000 RUFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
VREF 32.3000
WREF 10000
ZREF 10000
SCALE .0300

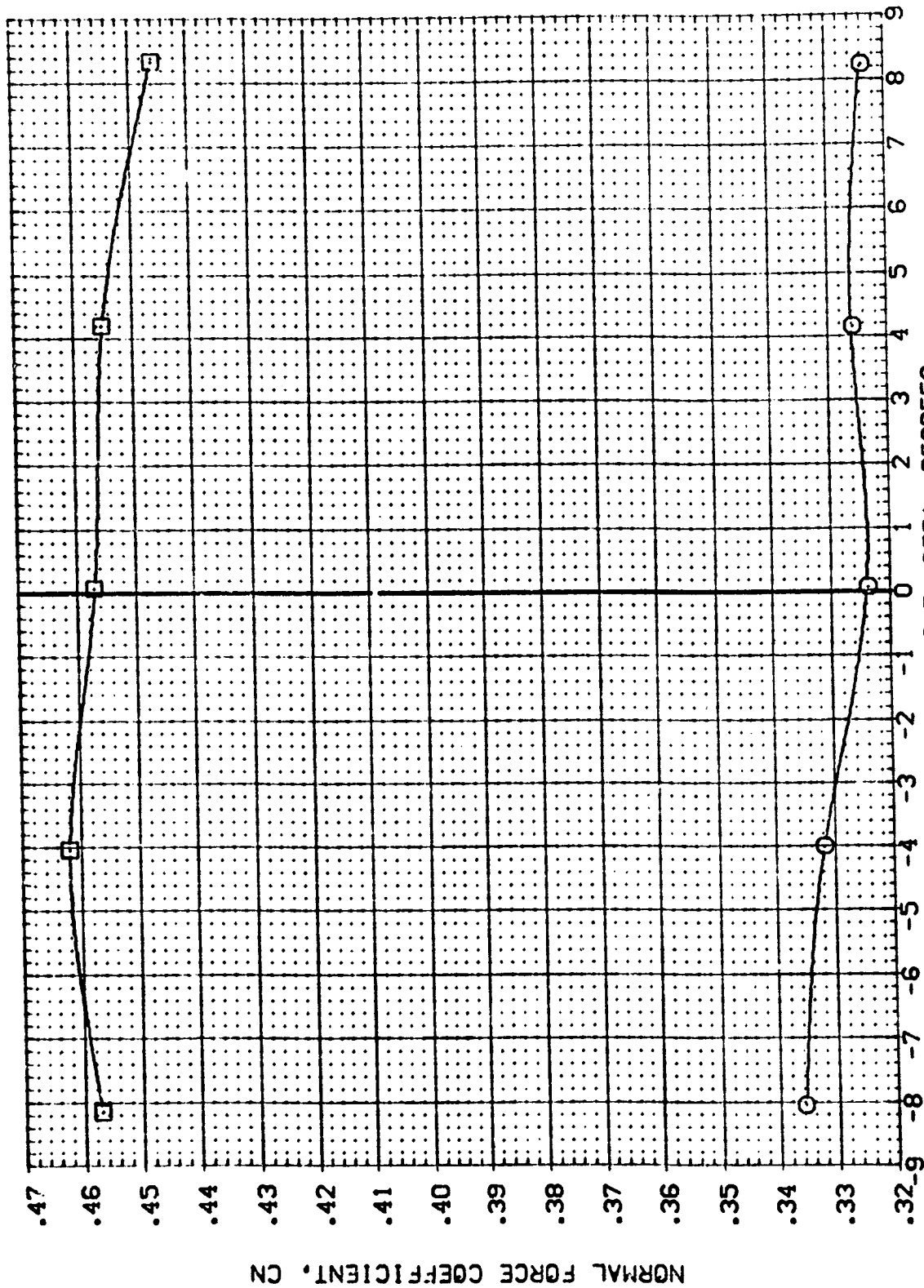


FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900

(RBP024)

AMES 11-707 0A12 02A

SYMBOL
☐ ☐

MACH .599
ALPHA .900
PARAMETRIC VALUES
10.000 ELEVON -10.000
.000 RUOFLR .000

REFERENCE INFORMATION
SQ.FT.
SREF 2.4210
LREF 38.8480
BREF 38.8480
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

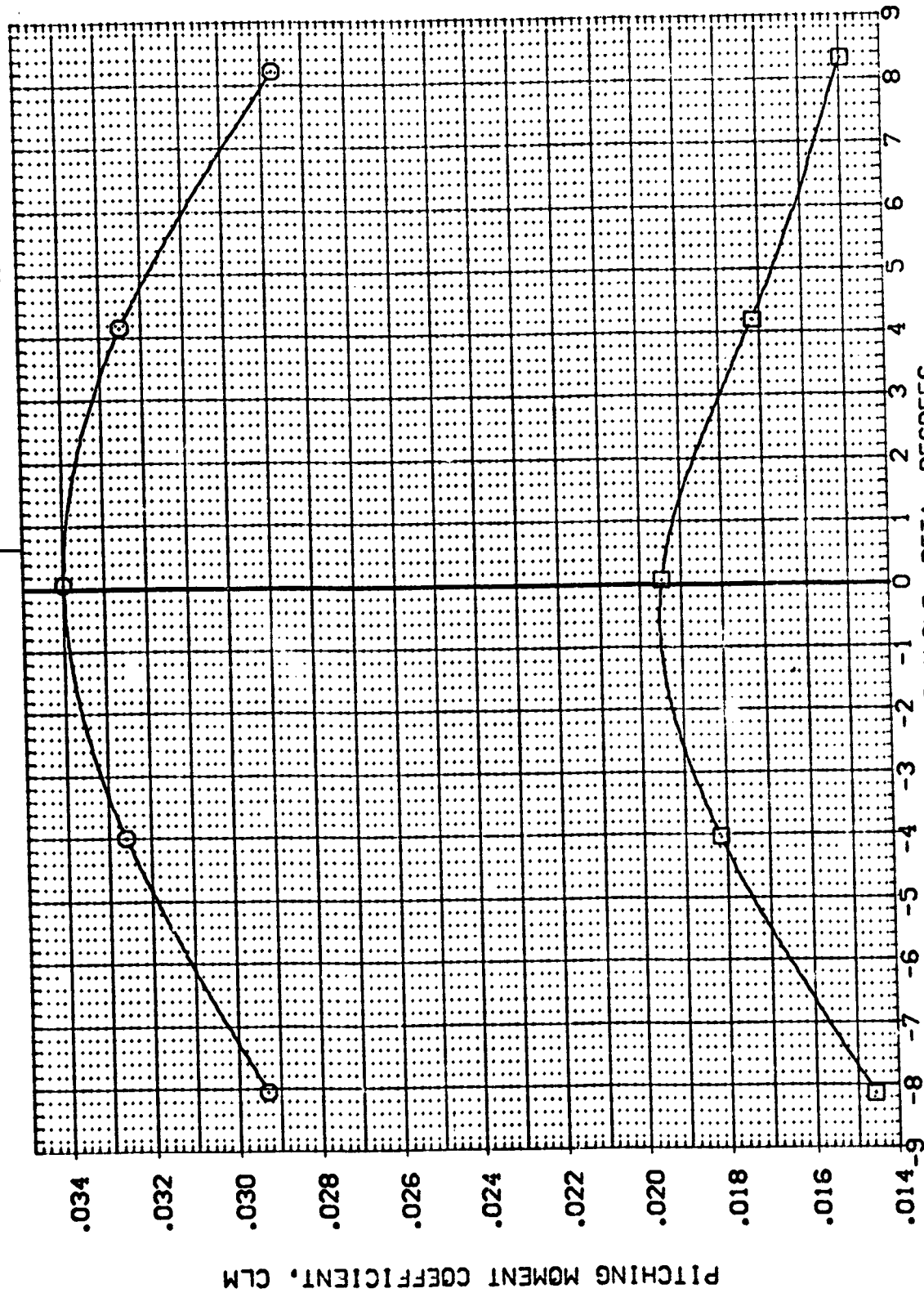


FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900



AMES 11-707 0A12 02A

(RBP024)

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.599	RUDDER	10.000	SREF 2.4210
○	.500	ELEVON	-10.000	LREF 39.8450
		RUOFLR	.000	BREF 39.8450
				XREF 32.3000
				YREF .0000
				ZREF .0000
				SCALE .0300

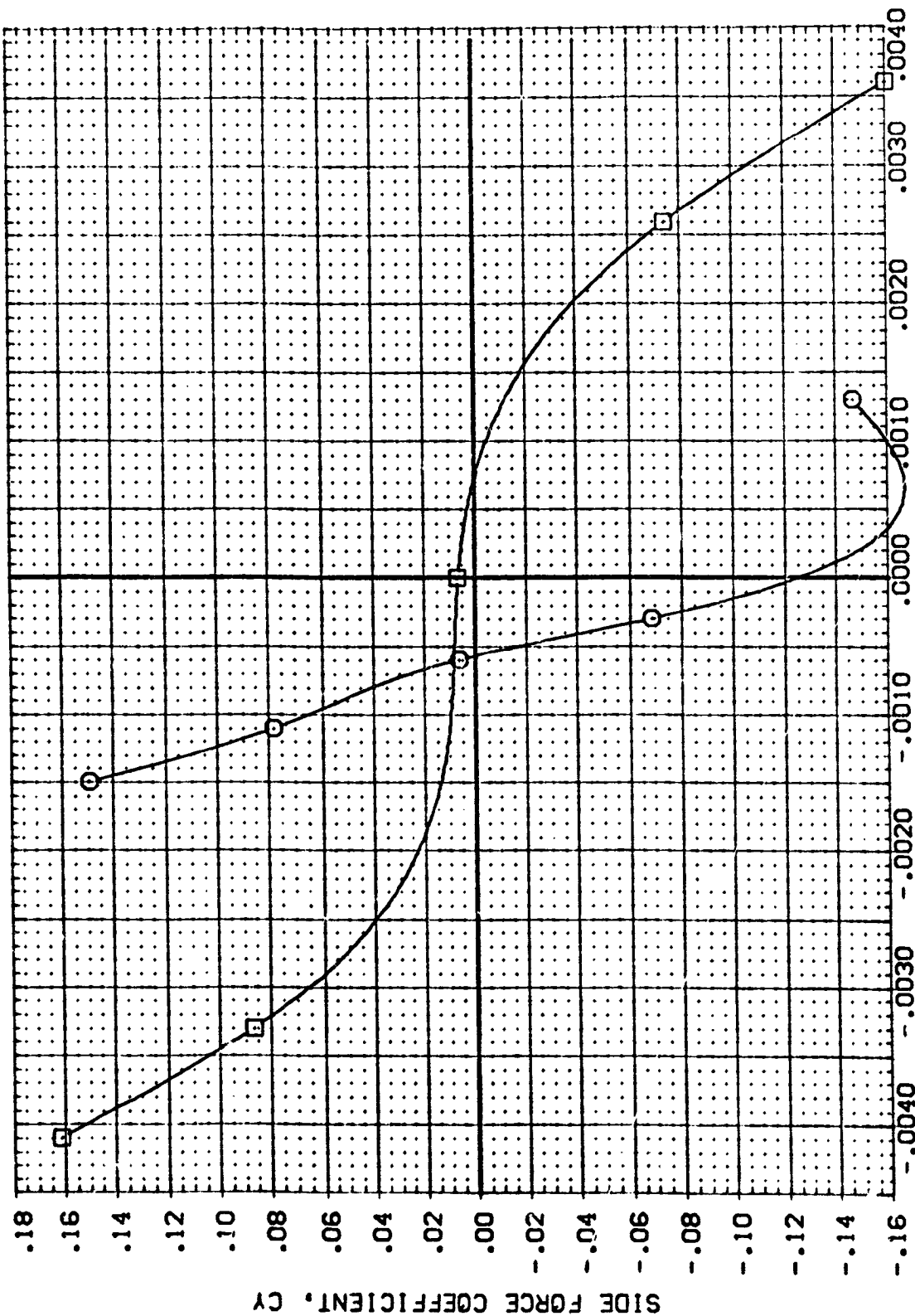


FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599,0.900



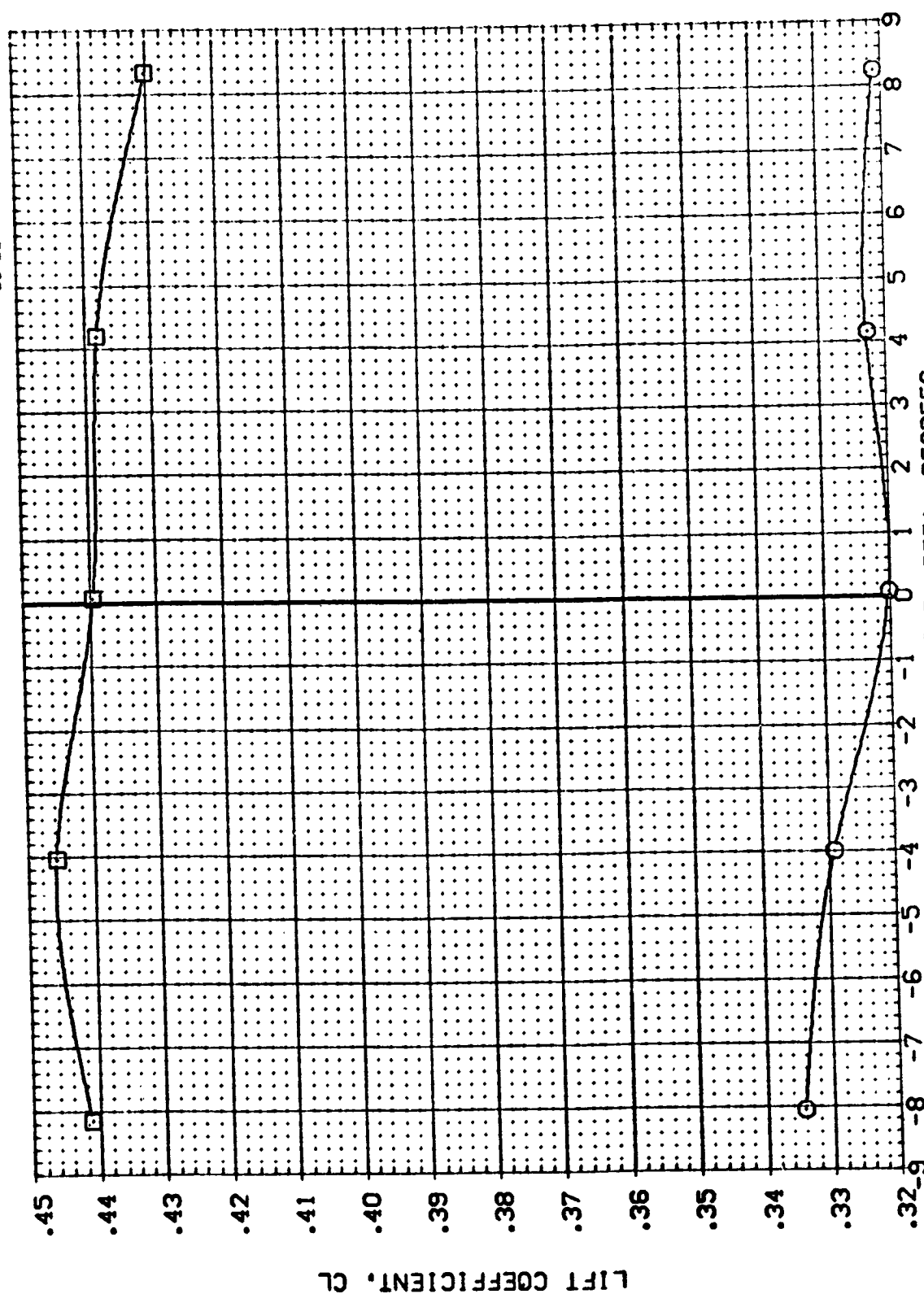
(ABP024)

AMES 11-707 OA12 02A

SYMBOL
□

MACH .599
ALPHA .000
RUDDER .000
ELEVON -10.000
RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRD 32.3000 IN.
YMRD .0000 IN.
ZMRD .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.27 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-10 DEGS., MN=0.599, 0.900



(RBP025)

AMES 11-707 0A12 02A

SYMBOL
☐ ☐

MACH
.598
.899

PARAMETRIC VALUES
ALPHA 15.000 ELEVON -10.000
RUDDER .000 RUOFFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

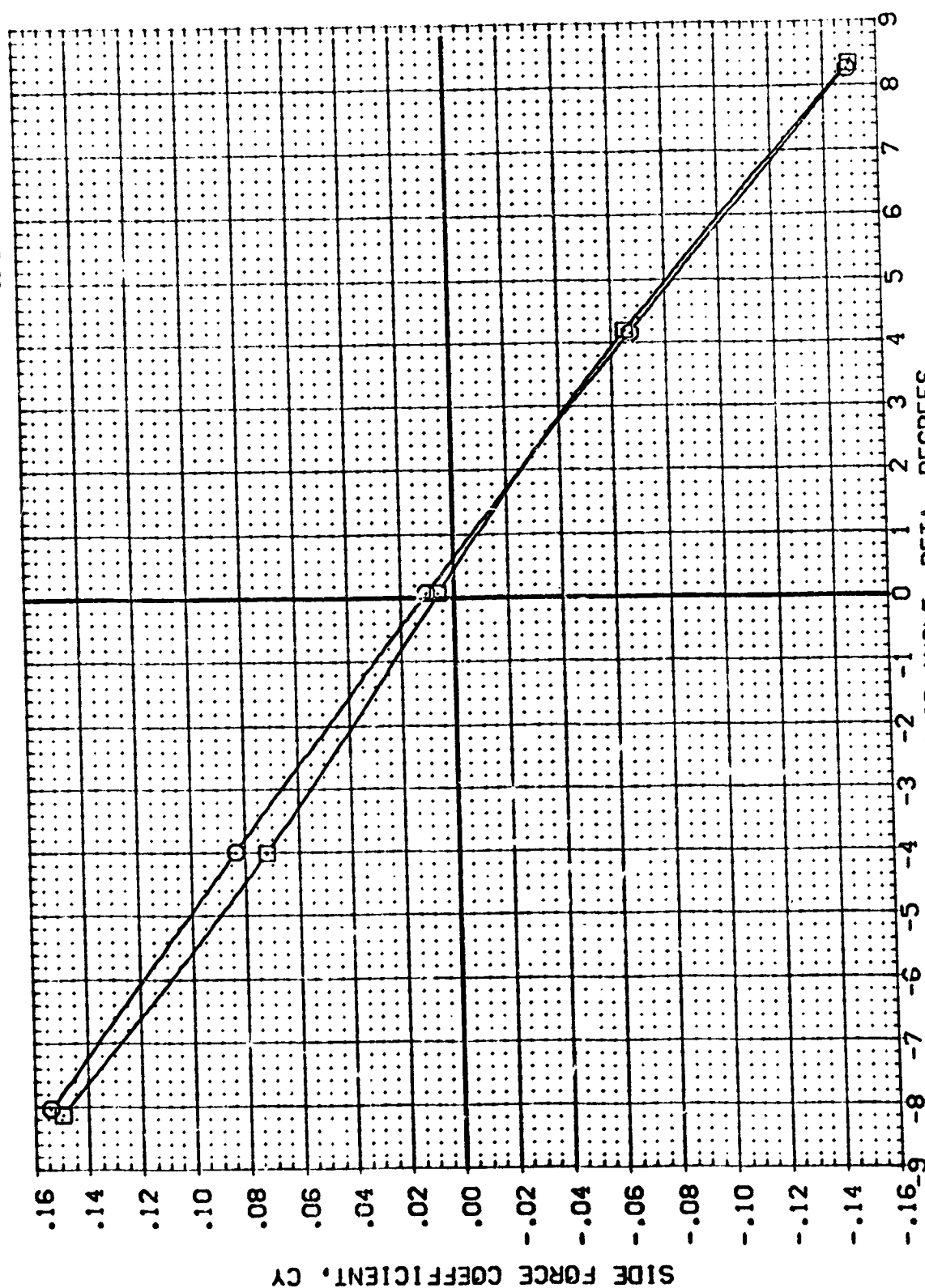


FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598,0.899
PAGE 2:6

(RBP025)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .598
□ .899

PARAMETRIC VALUES

15.000 ELEVON -10.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

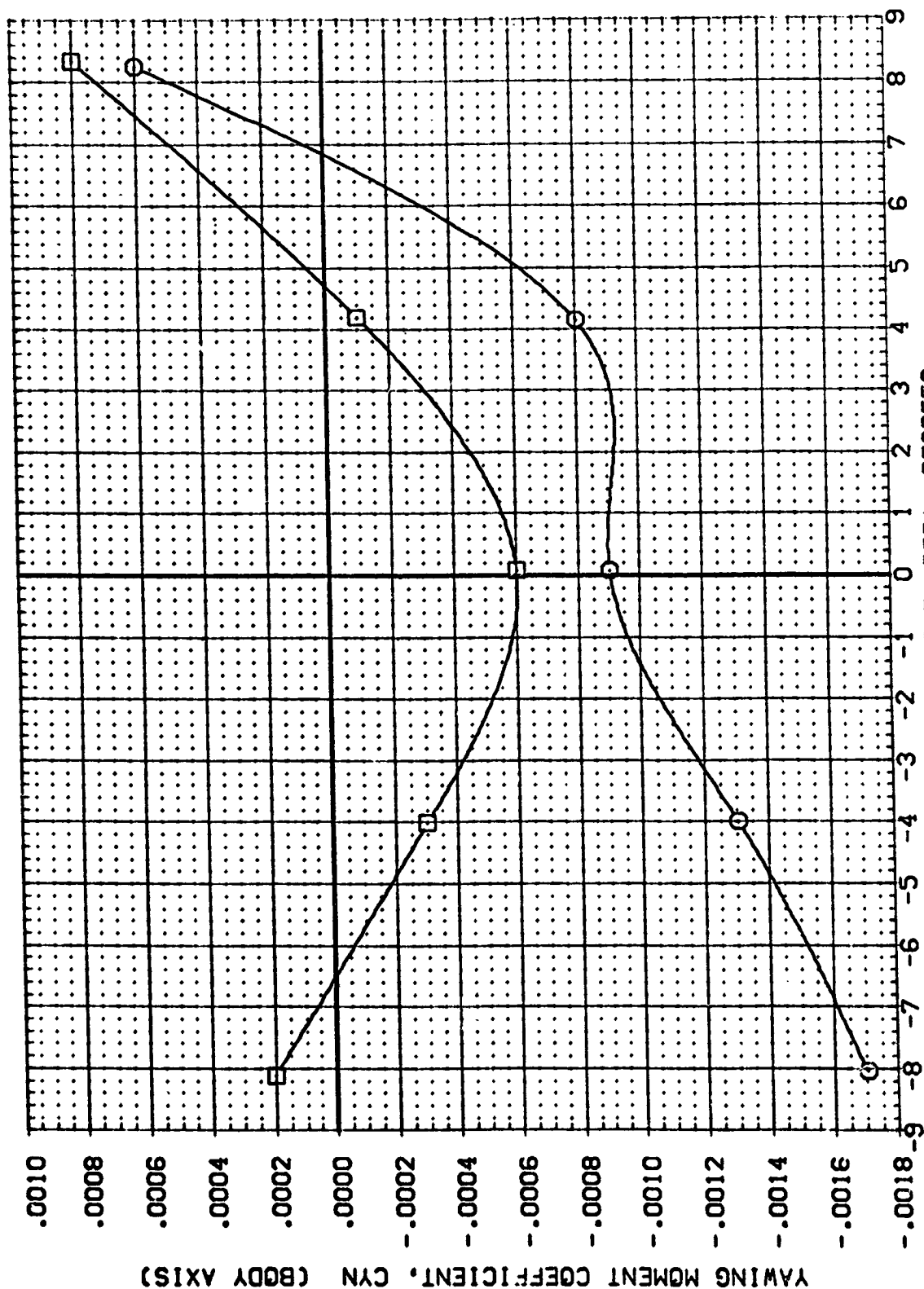


FIG.28 ORBITER LAT-OIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598, 0.899

(RBP025)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES ELEVON RUDFLR
O .598 .899 .000 .000 -10.000
□ .000 .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300

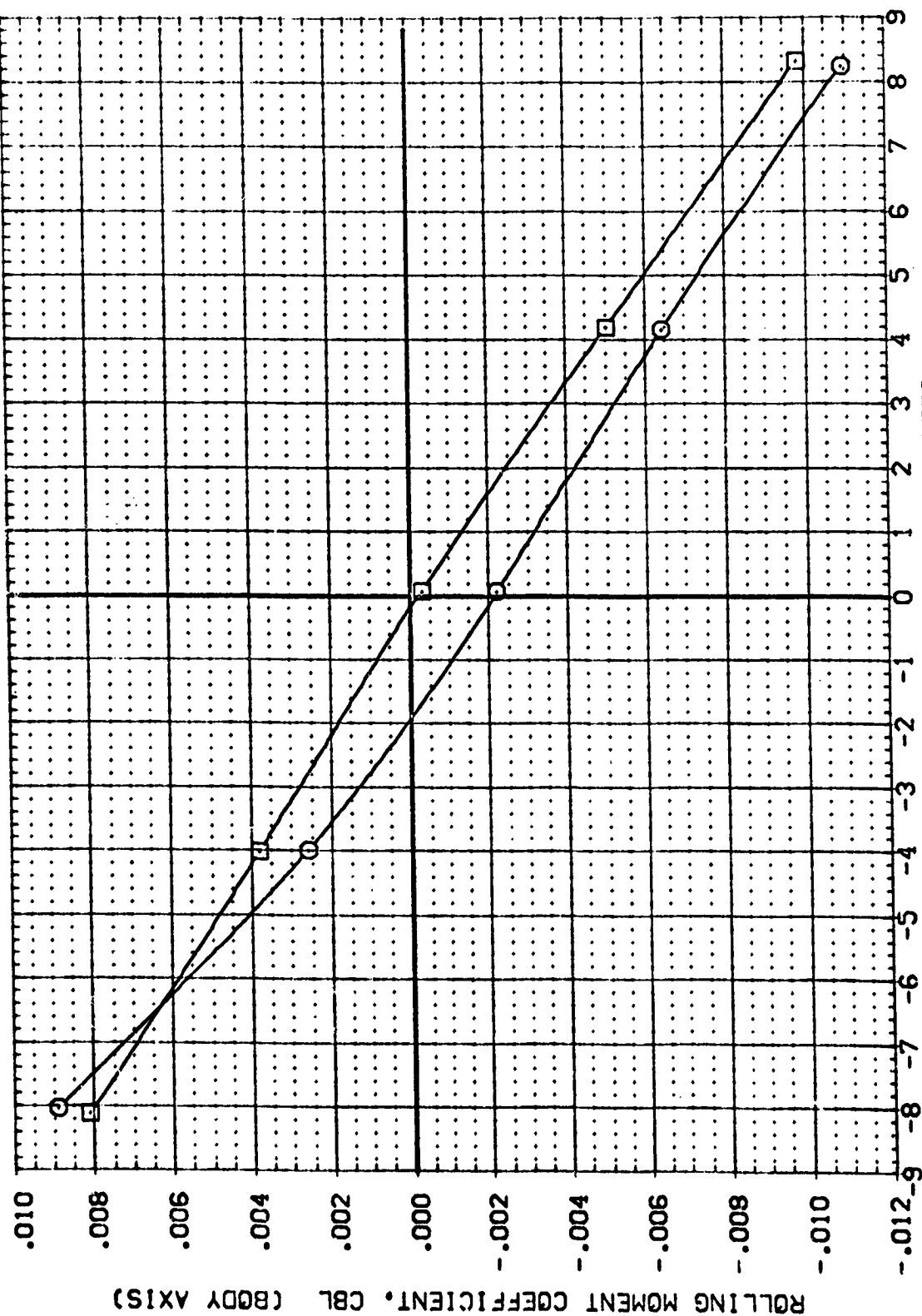


FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598,0.899
PAGE 2:8

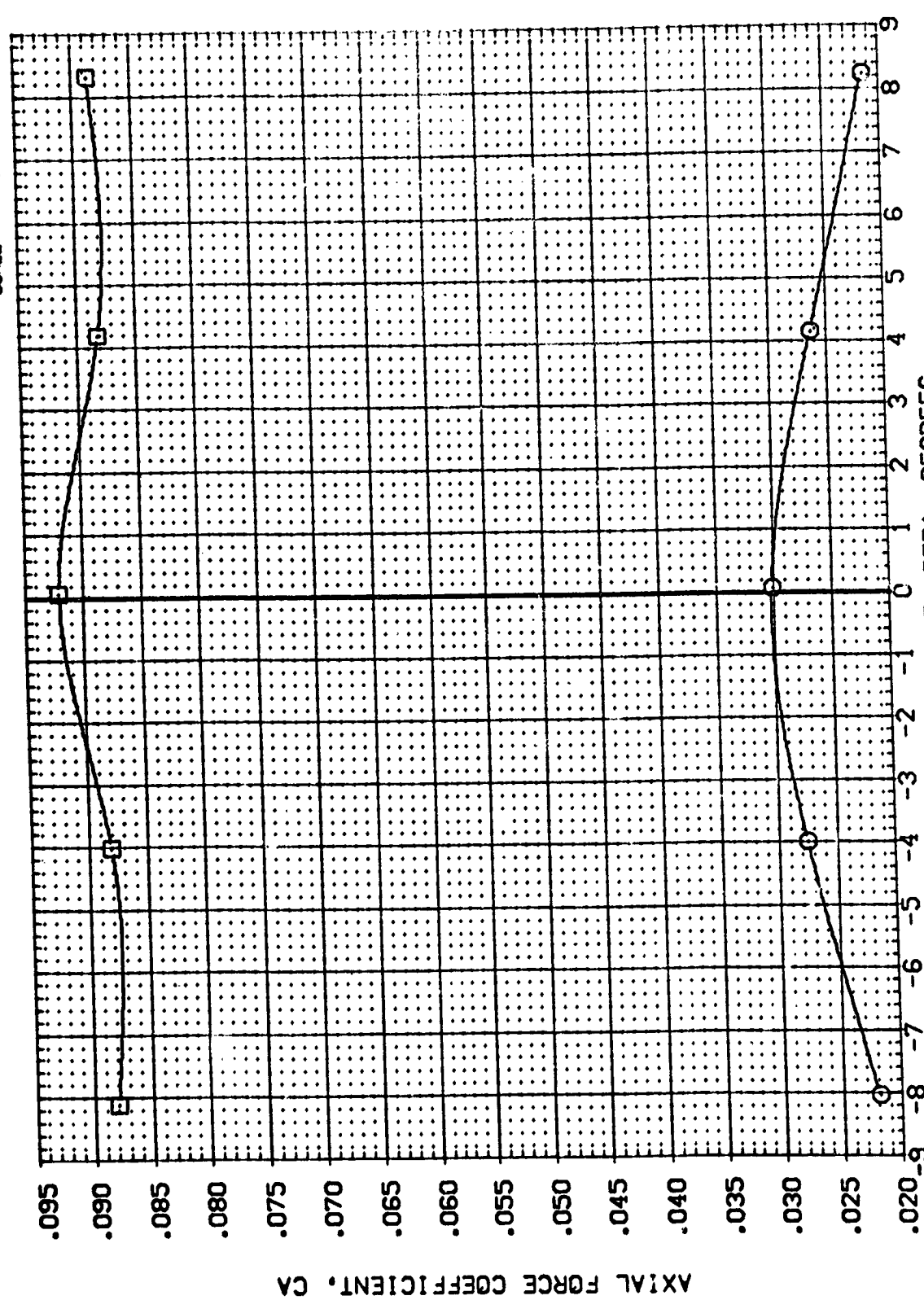


(RBP025)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 □ .598 .899
 □ .000 .000
 □ .000 .000
 □ .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8490 IN.
 BREF 38.8490 IN.
 XGRP 32.3000 IN.
 YGRP .0000 IN.
 ZGRP .0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598, 0.899

AMES 11-707 0A12 02A

SYNOPSIS

100

PARAMETRIC VALUES

3

00

368.
365.

ALPHA
RUDDER

15.000	ELEVON
.000	RUDFLR

000-10.000

REFERENCE INFORMATION		SO.FT.
SREF	2.4210	IN.
LREF	39.8490	IN.
BREF	39.8420	IN.
XREF	32.3000	IN.
YREF	.0000	IN.
ZREF	.0000	IN.
SCALE	.0300	SCALE

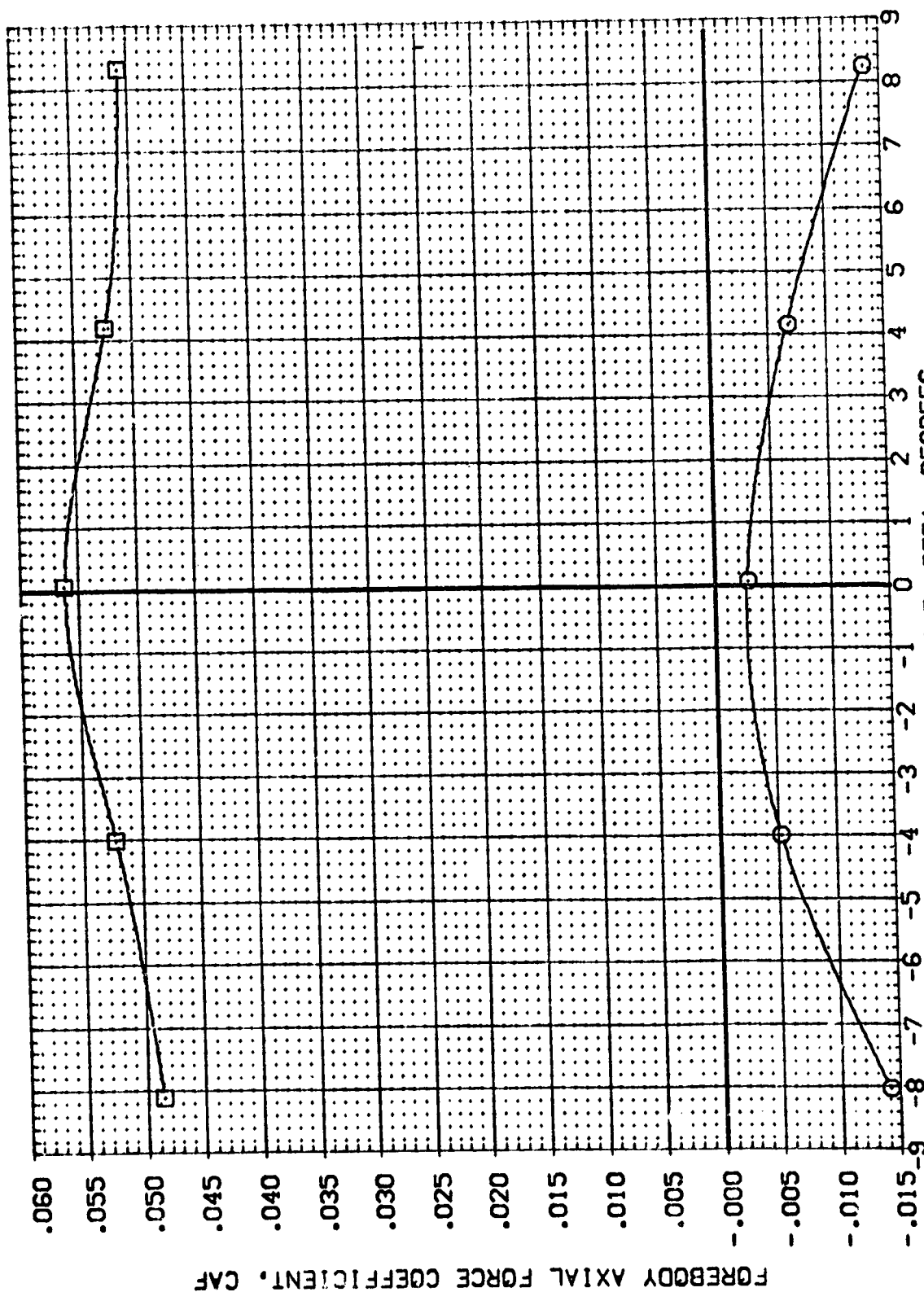


FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598, 0.899

(RBP025)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR
O .598 .899 .000 15.000 .000 -10.000
□ .000 .000 .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XGRP 32.3000 IN.
YGRP .0000 IN.
ZGRP .0000 IN.
SCALE .0300

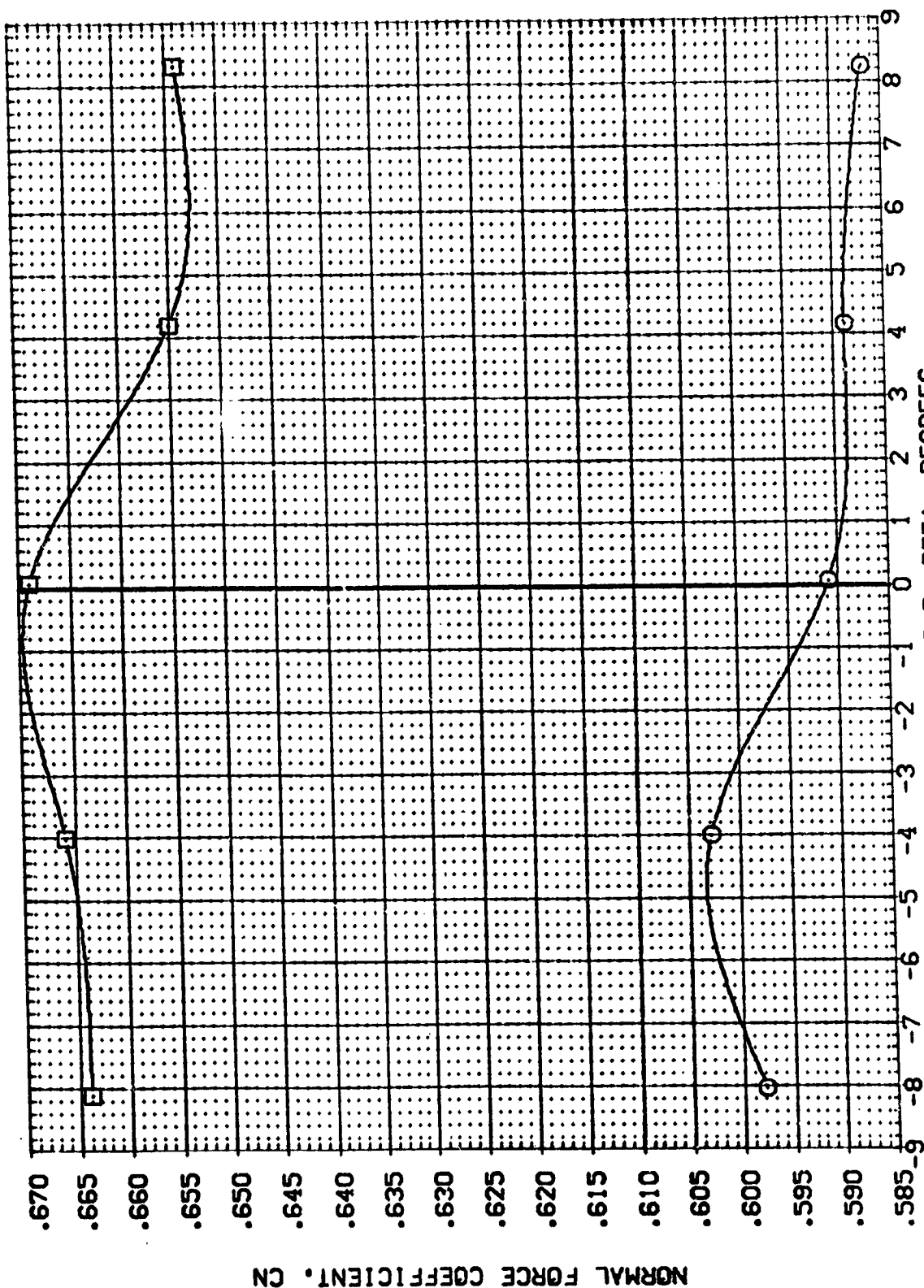


FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598, 0.899

(RBP025)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
YREF 32.3000 IN.
ZREF .0000 IN.
SCALE .0300

PARAMETRIC VALUES
MACH .598 ALPHA 15.000 ELEVON -10.000
RUDDER .000 RUOFLR .000

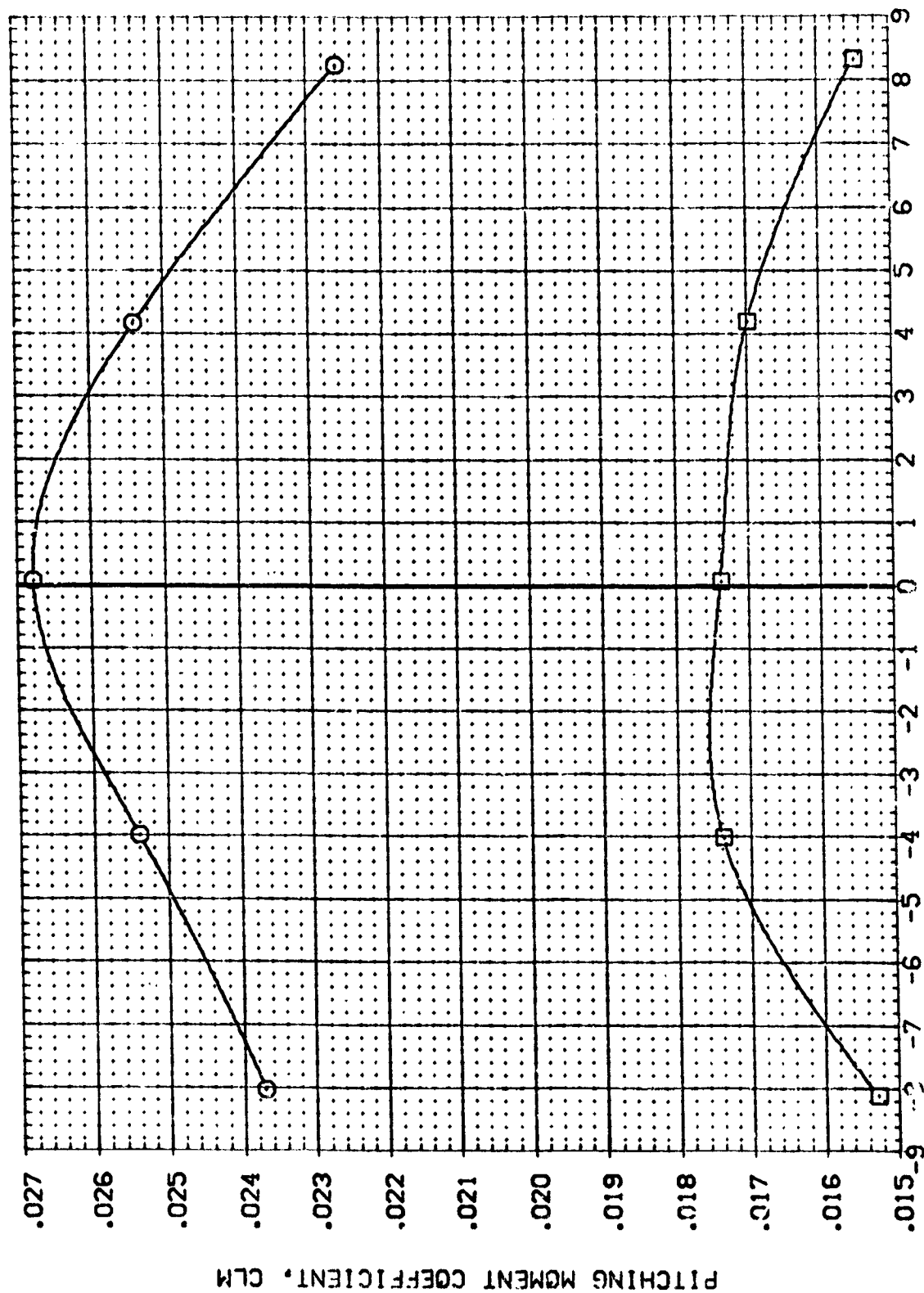


FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598,0.899

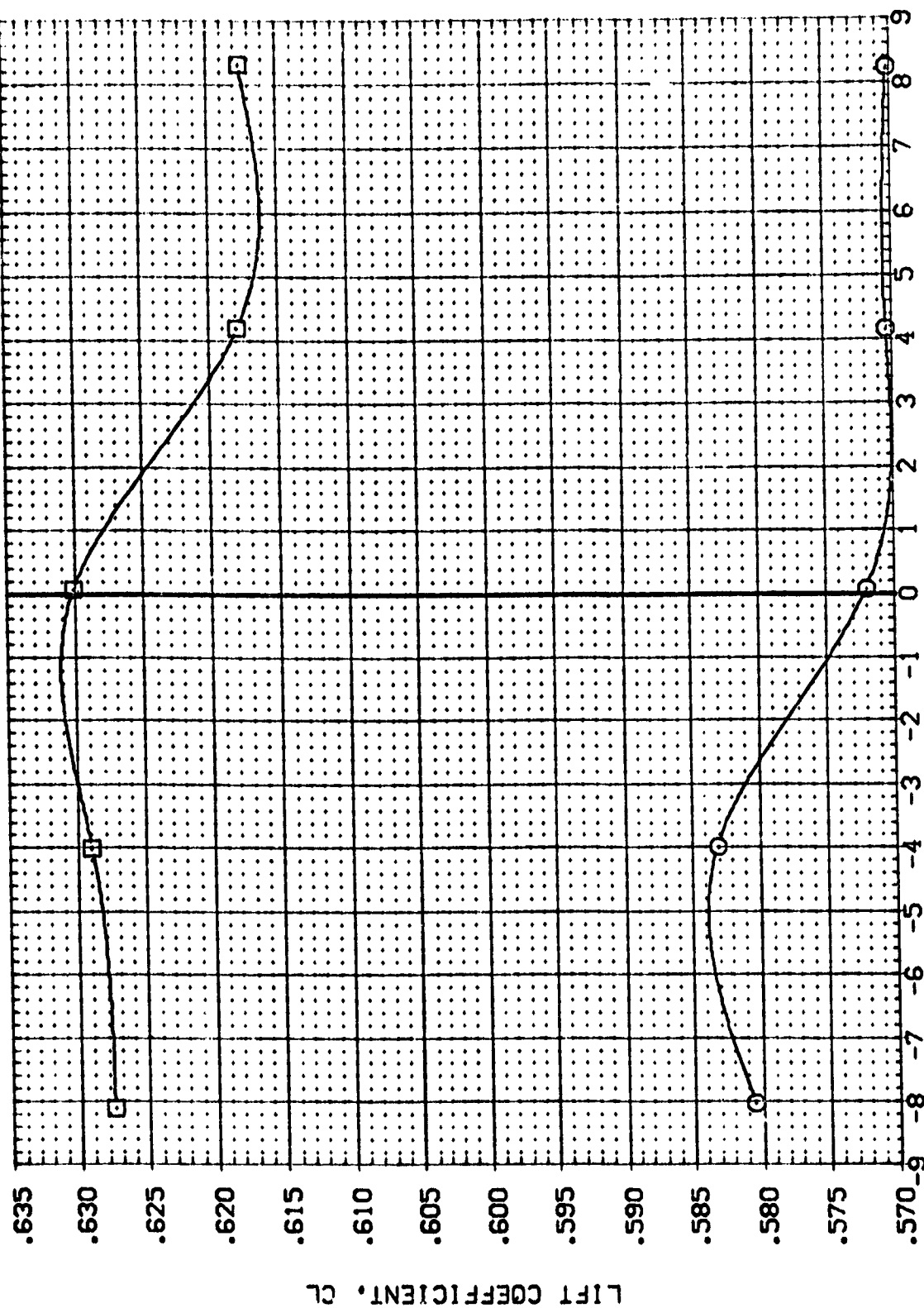
(ABP025)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER
○ .598 .899
□ 15.000 .000

PARAMETRIC VALUES
ELEVON -10.000
RUDFLR .000

REFERENCE INFORMATION
SREF 2.9210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XGRP 32.3000 IN.
YGRP .0000 IN.
ZGRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

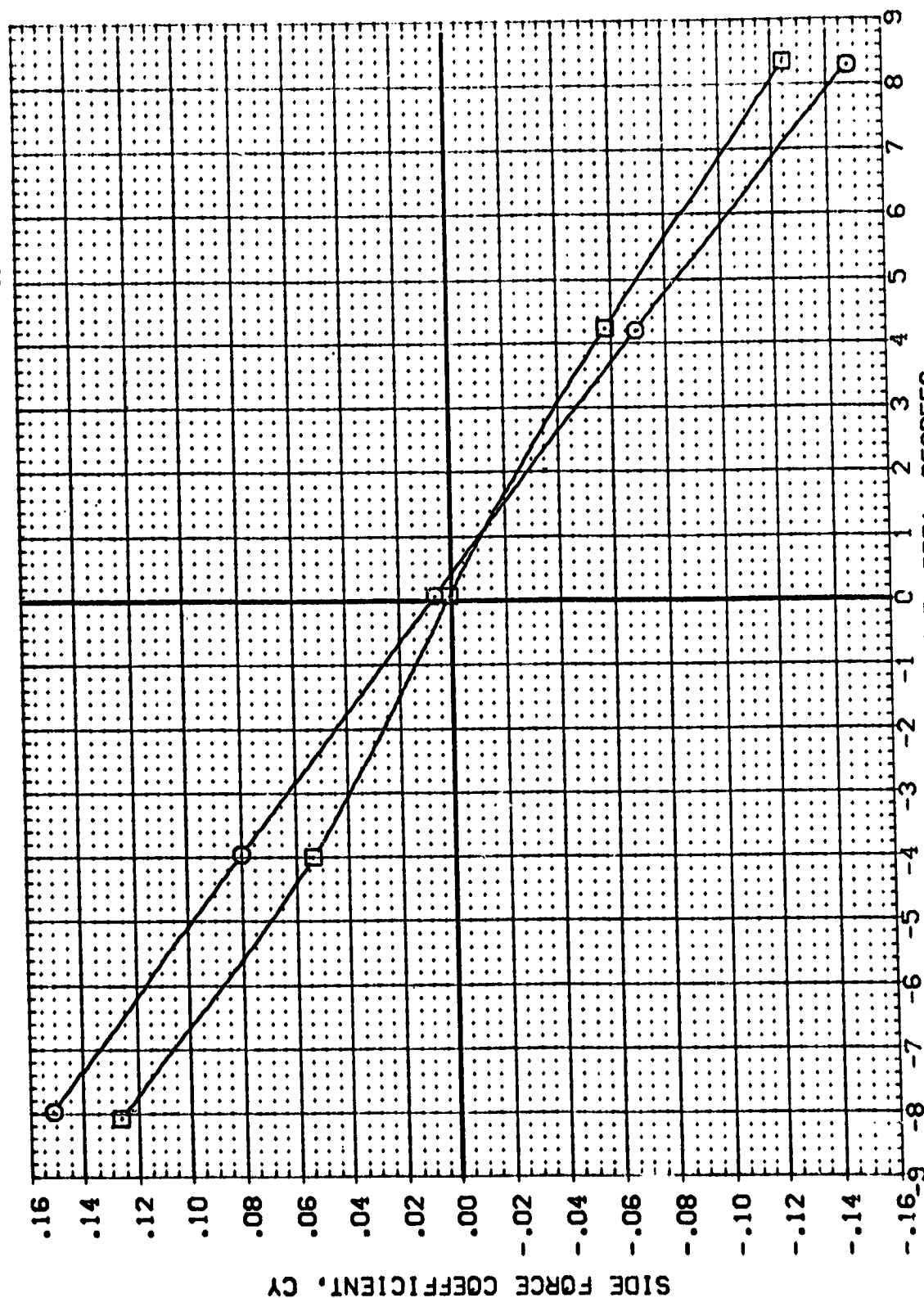
FIG.28 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-10 DEGS., MN=0.598,0.899

(RBP026)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .599 .904
□ 20.000 .000
PARAMETRIC VALUES
ELEVON -10.000
RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300
SS.FT.
IN.
IN.
IN.
IN.
SCALE



SIDESLIP ANGLE, BETA, DEGREES

FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599,0.904

(RBP026)

AMES 11-707 0A12 02A

SYMBOL

○ □

MACH

.599
.504

ALPHA
RUDDER

PARAMETRIC VALUES

20.000 ELEVON -10.000
.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
YPRP 32.3030 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

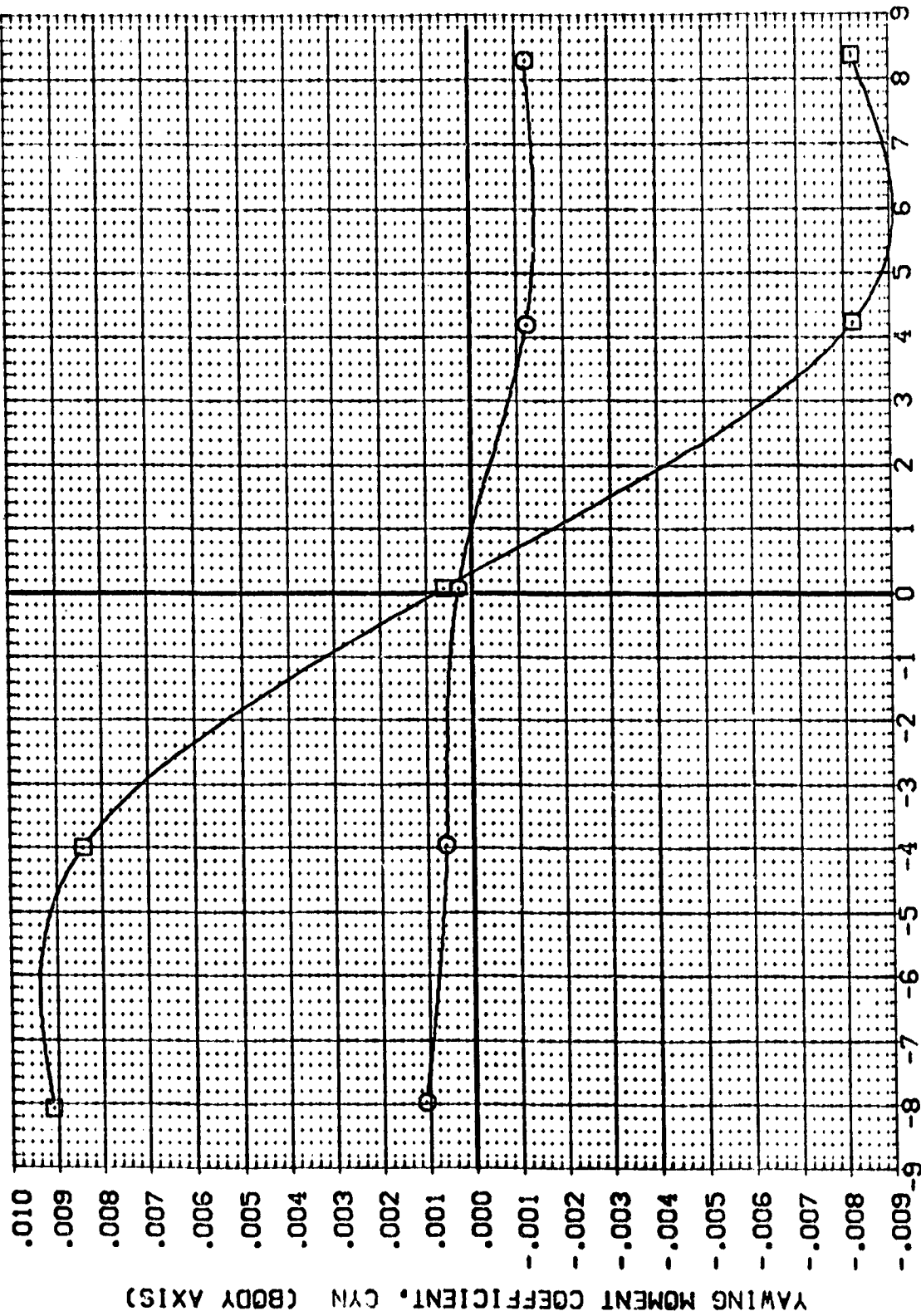


FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599,0.904

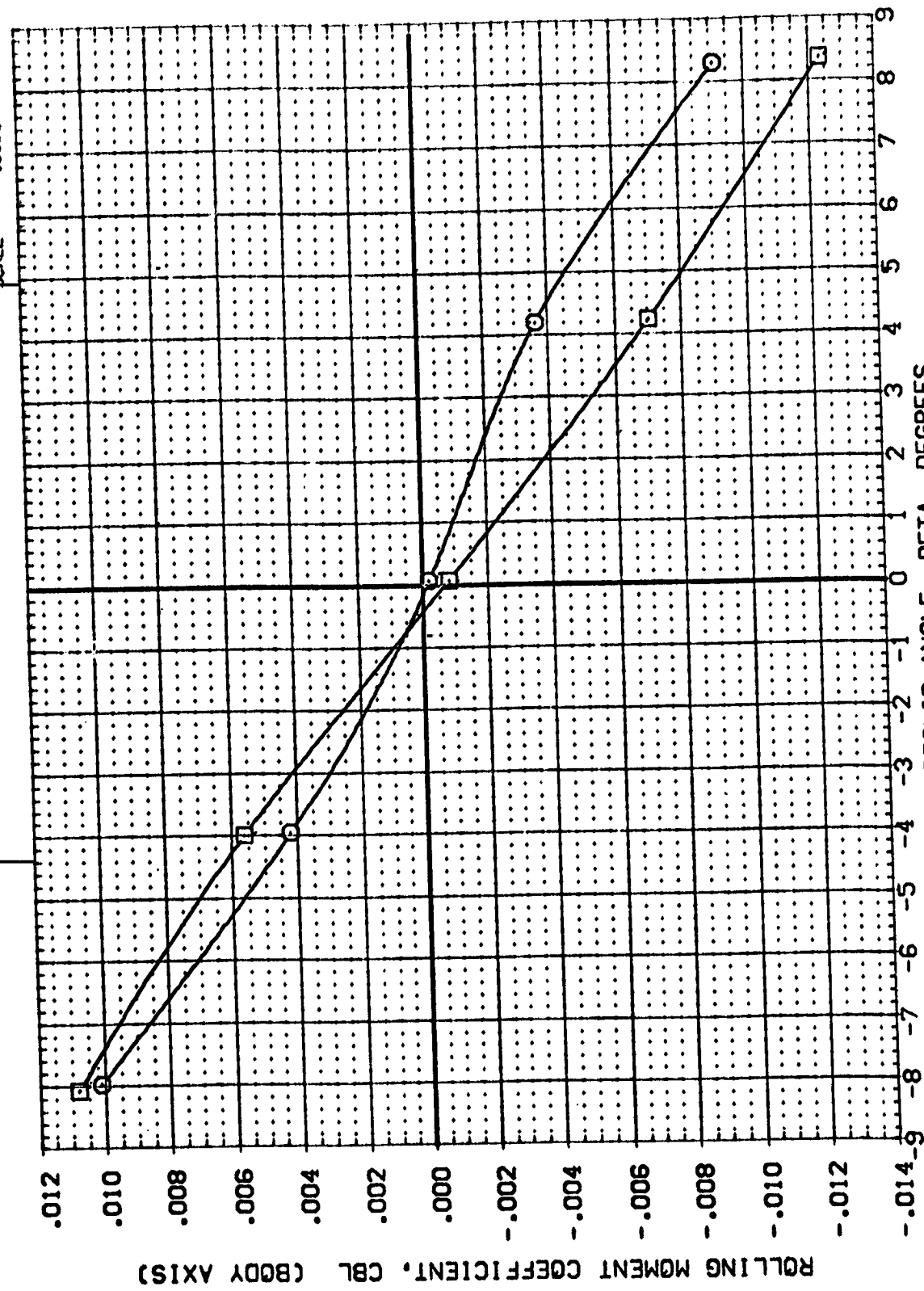
(RBP026)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .599 .000
□ .904 .000

PARAMETRIC VALUES
20.000 ELEVON
.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599, 0.904

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AMES 11-707 0A12 02A

SYMBOL	MOD	PARAMETRIC VALUES
<input type="checkbox"/>	.589	ALPHA 20.000 ELEVON -10.000
<input type="checkbox"/>	.904	RUDDER .000 RUDFLP .000

REFERENCE INFORMATION	
SREF	2.4218 SQ. FT.
LREF	39.8490 IN.
BREF	39.8490 IN.
WREF	32.3000 IN.
VREF	.0000 IN.
ZREF	.0000 IN.
SCALE	.0000 SCALE

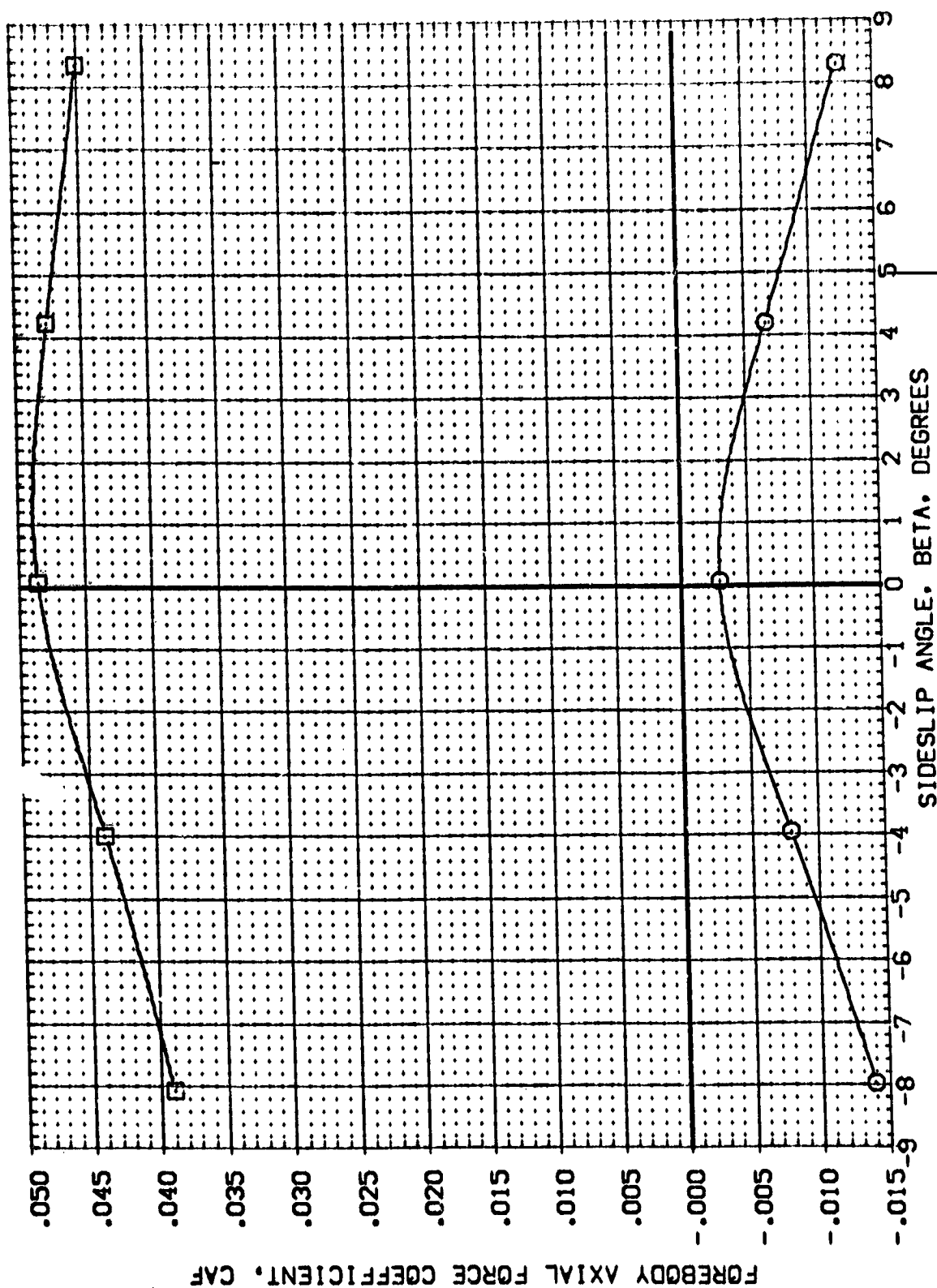


FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599,0.904

(RBPO26)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
○	.599	RUDDER	20.000 ELEVON -10.000	SREF 2.4210 SQ.FT.
□	.904		.000 RUOFLR .000	LREF 39.8490 N.
				SREF 39.8450 N.
				XMGRP 32.3000 N.
				YMGRP .0000 N.
				ZMGRP .0000 N.
				SCALE .0300

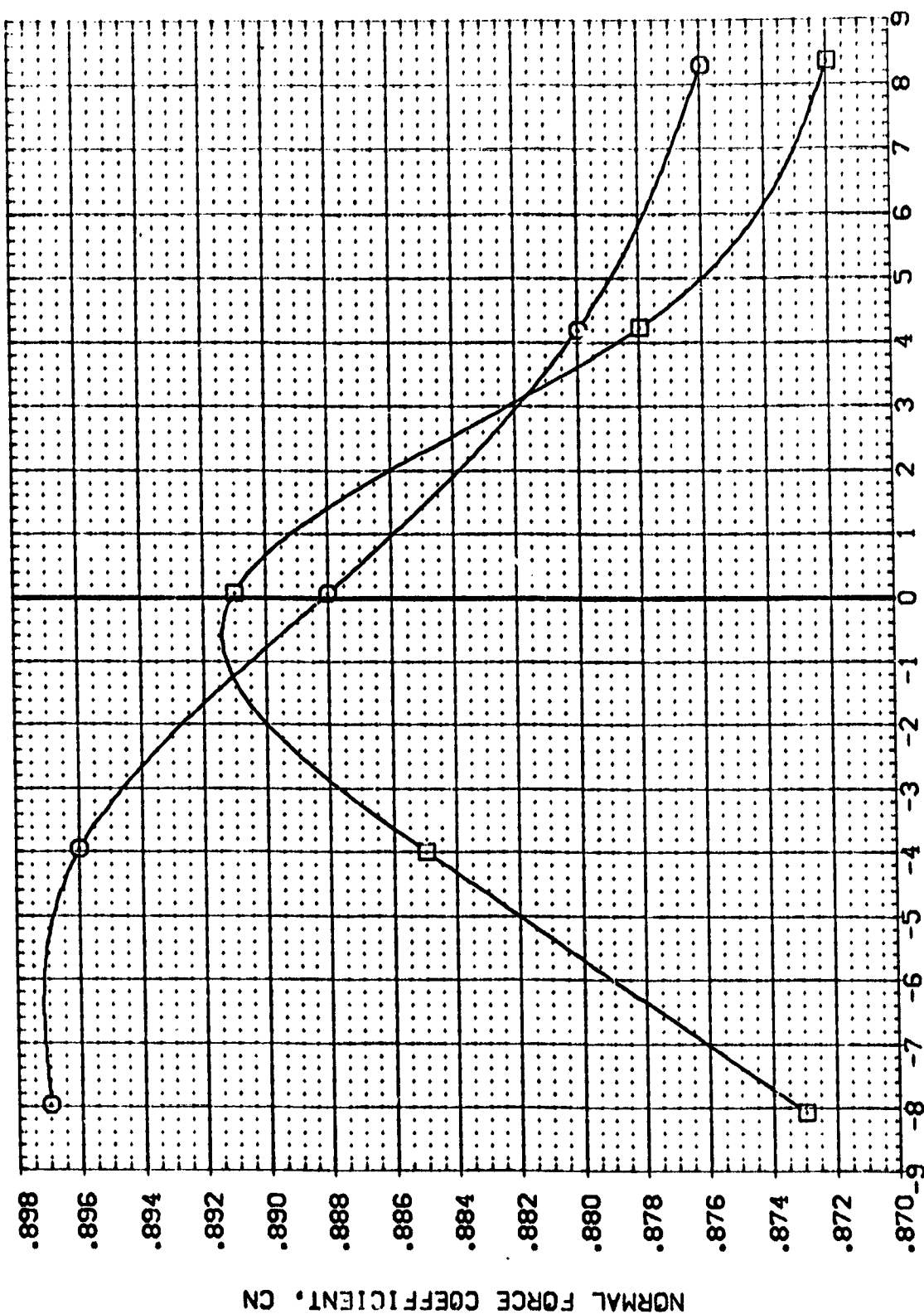


FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599,0.904

(RBP026)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUGGER 20.000 ELEVON -10.000
□ .599 .504 .000 RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 19.855
BREF 19.855
XREF 17.3000
YREF 17.3000
ZREF 17.3000
SCALE 0.000

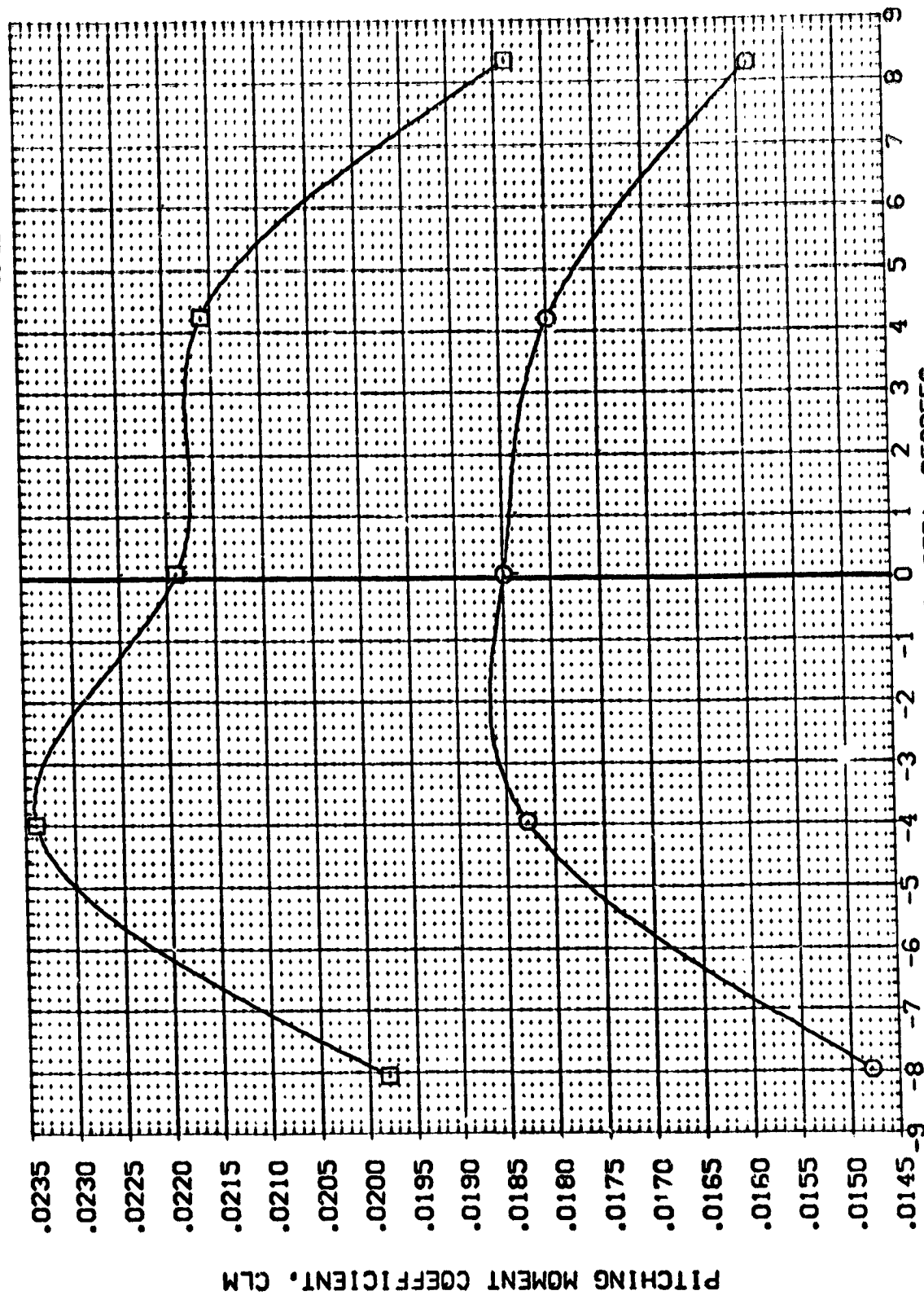


FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599, 0.904

(RBPC26)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	-10.000
○	.589	RUDER	20.000	RUOFLR	.000
□	.974		.000		

REFERENCE INFORMATION	
SREF	2.4210
LREF	29.8490
BREF	38.8480
XREF	32.3000
YREF	.0000
ZREF	.0000
SCALE	1.000

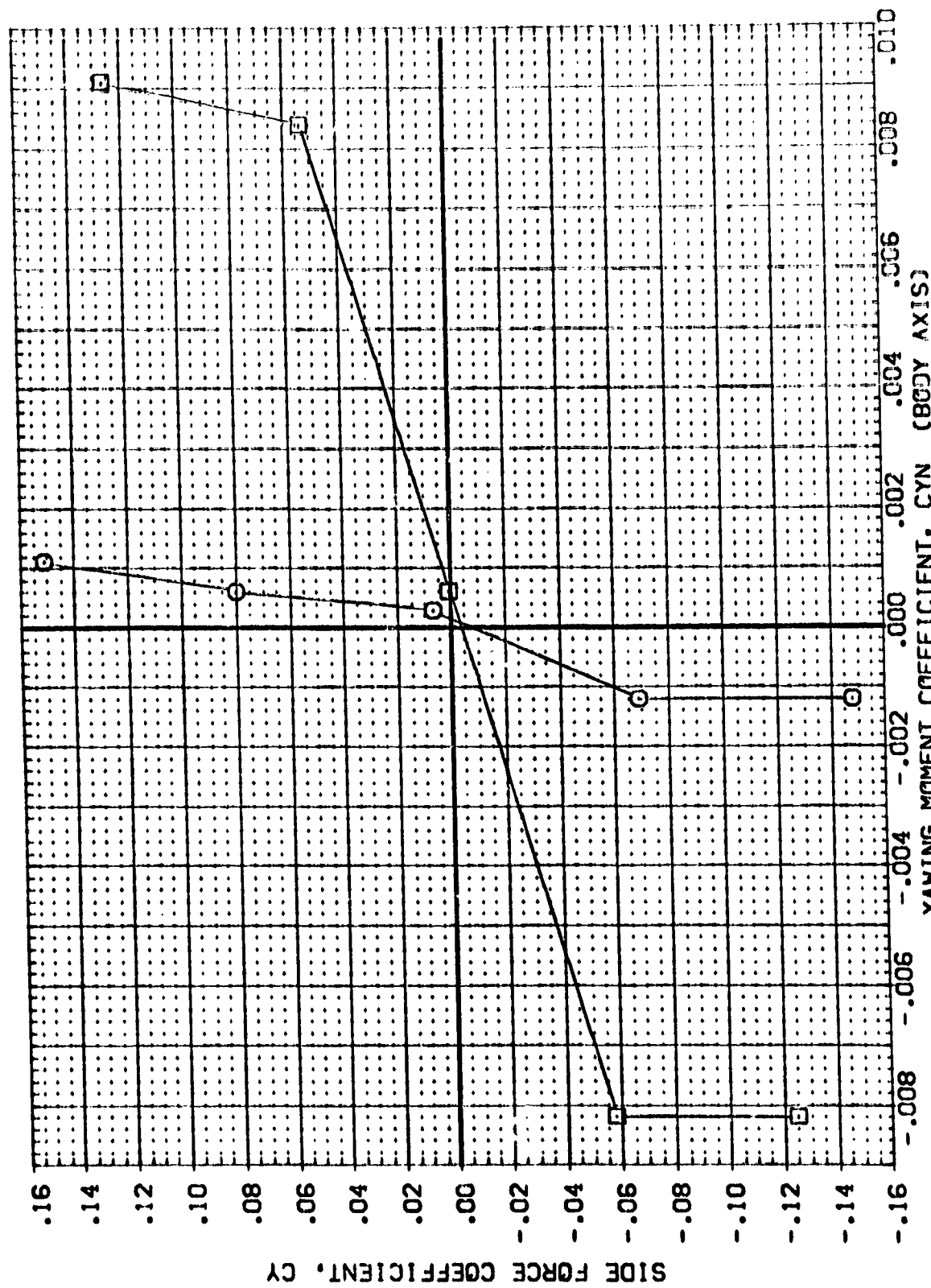


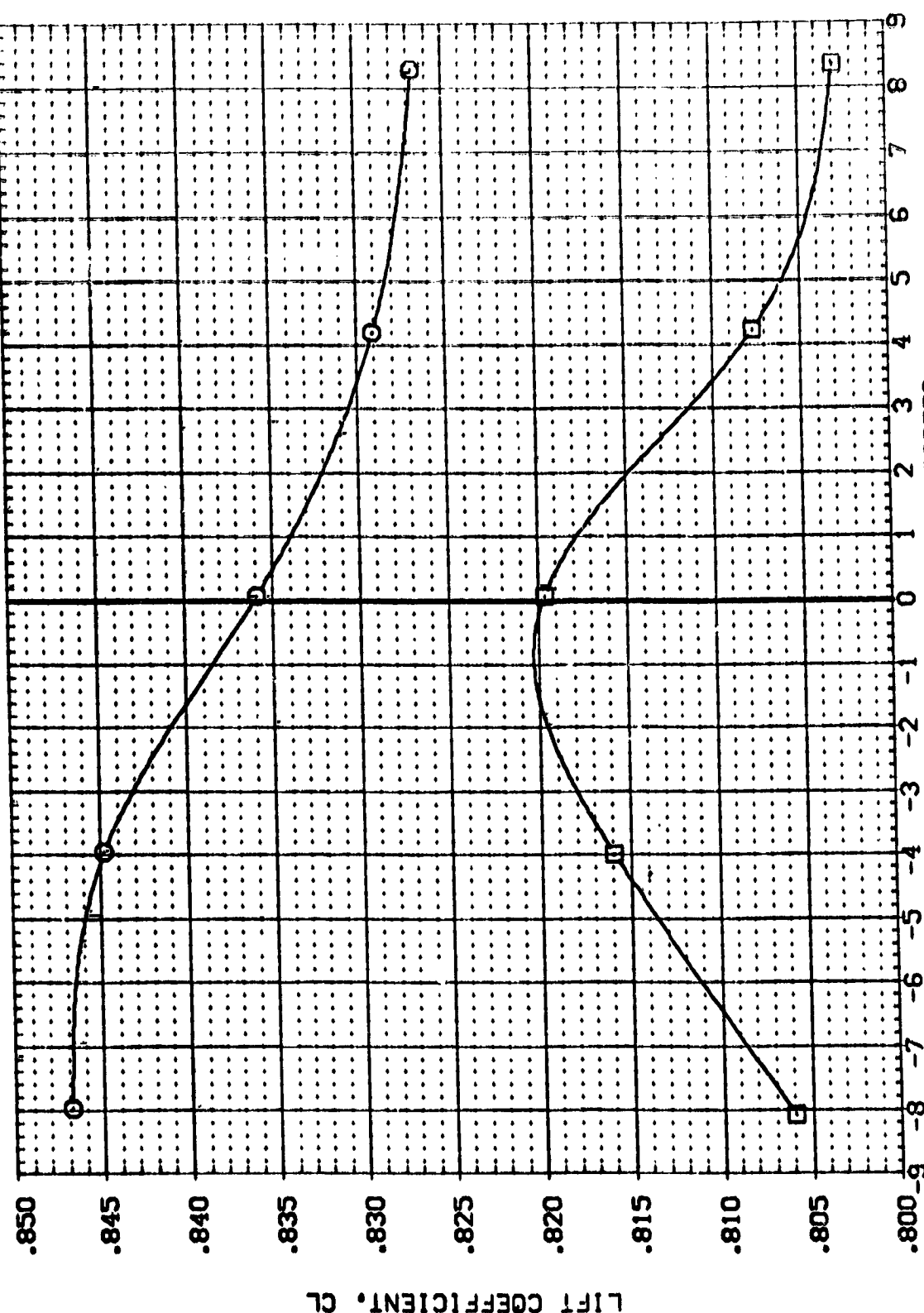
FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.593,0.904
PAGE 232

(ABP026)

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
O .589 .000 .000 ELEVON -10.000
□ .904 .000 .000 RUDLER .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 18.8450 IN.
XREF 12.3000 IN.
YREF .0000 IN.
ZREF .0000 IN.
SCALE 1:300



SIDESLIP ANGLE, BETA, DEGREES

FIG.29 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-10 DEGS., MN=0.599, 0.904

(R5P027)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	ELEVON	RUDFLR
□	.500	RUDER	-4.000	-20.000	.000
□	.899		.000		

REFERENCE INFORMATION

SREF	2.1210	SCALE
LREF	30.8490	
BREF	30.8490	
XREF	30.8490	
YREF	30.8490	
ZREF	30.8490	
SCALE	1.000	

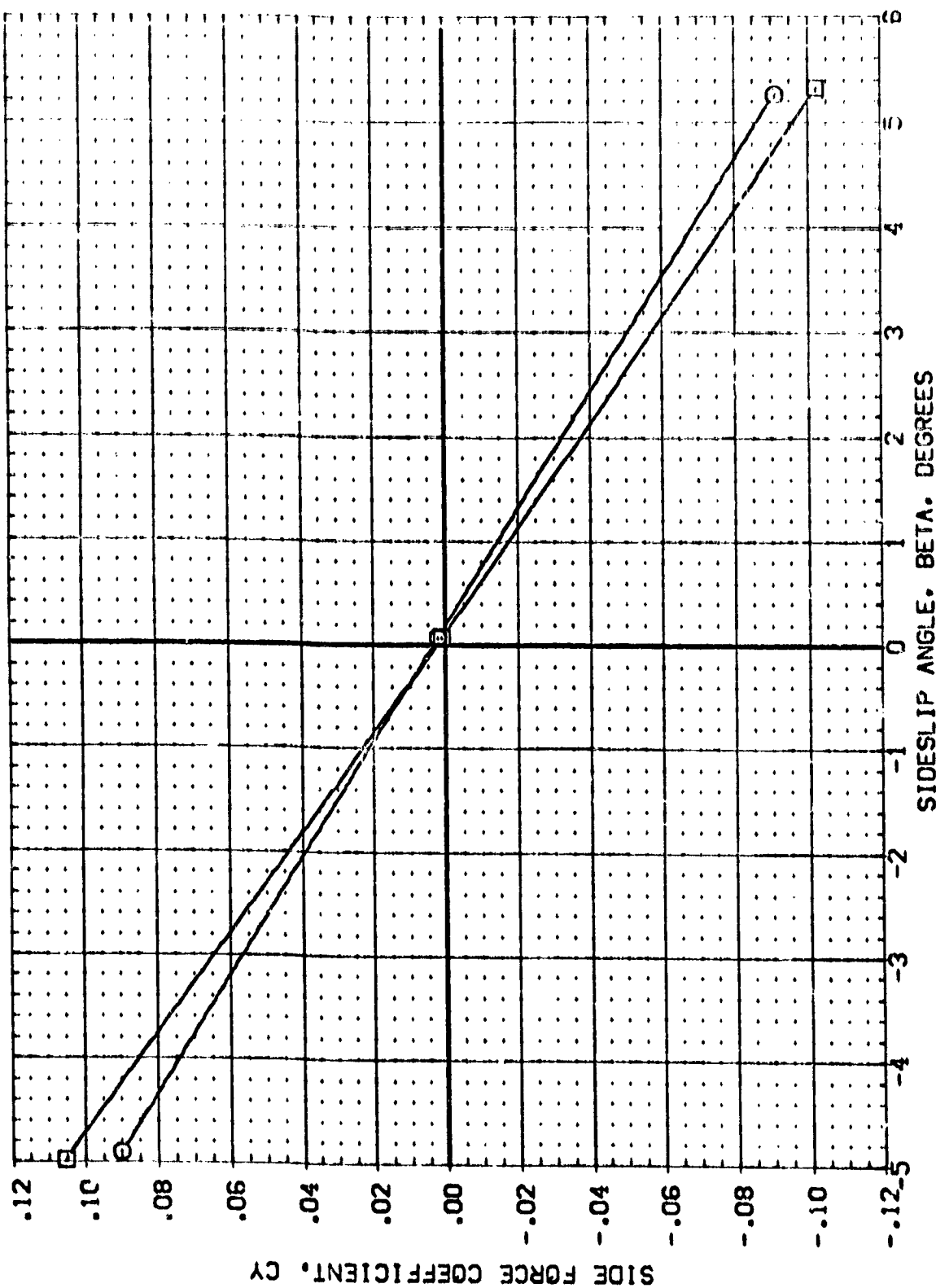


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600, D.899

(R8P027)

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON -20.000 RUDFLR .000

REFERENCE INFORMATION
SPEC 2.4213 SQ. FT.
LORE 19.6450 IN.
BOGE 33.6450 IN.
ACRP 27.3000 IN.
VREF 10.000 IN.
ZREF 10.000 IN.
SCALE 1000

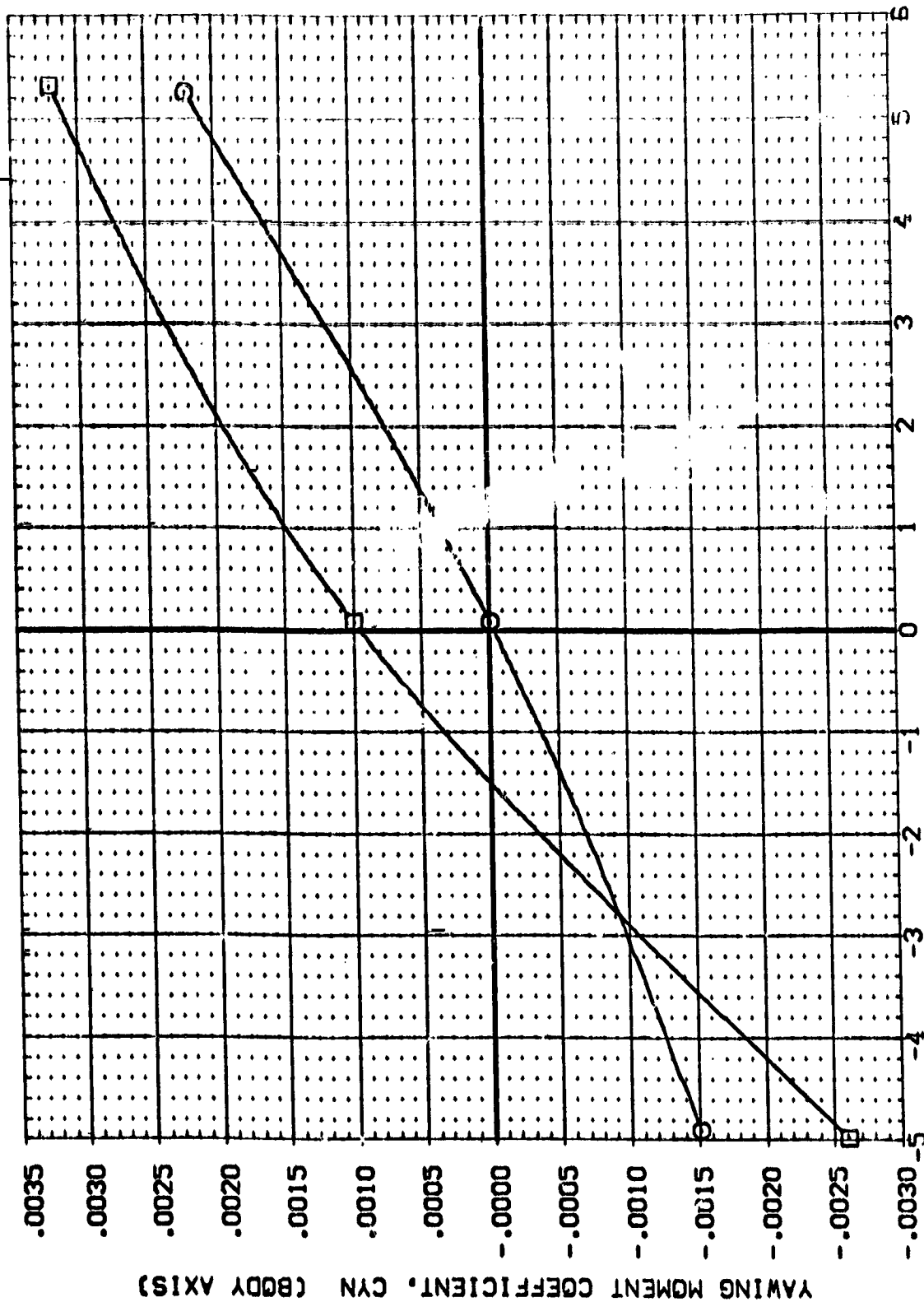


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600, D.899

(RBP027)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		
		ALPHA	ELEVON	RUDDER
○	.600	-4.000	-20.000	.000
□	.859	.000	.000	.000

REFERENCE INFORMATION	
SREF	2.4210
LREF	39.849C
BREF	39.849C
XMRP	32.500C
YMRP	.0000
ZMRP	.0000
SCALE	.0300

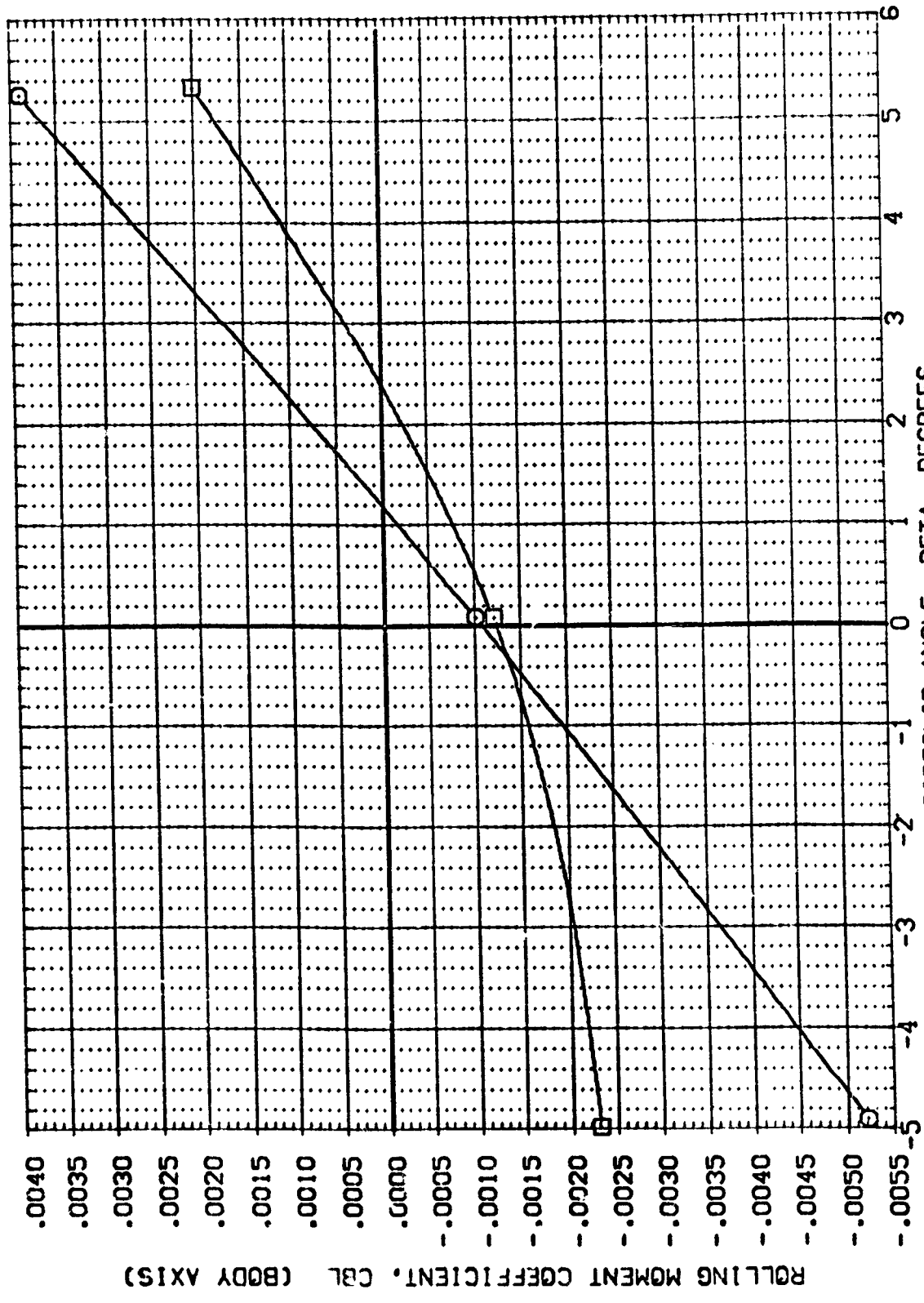


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600,0.899

(RBP027)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .600 .000
□ .899 .000

PARAMETRIC VALUES
-4.000 ELEVON -20.000
.000 RUDEL

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

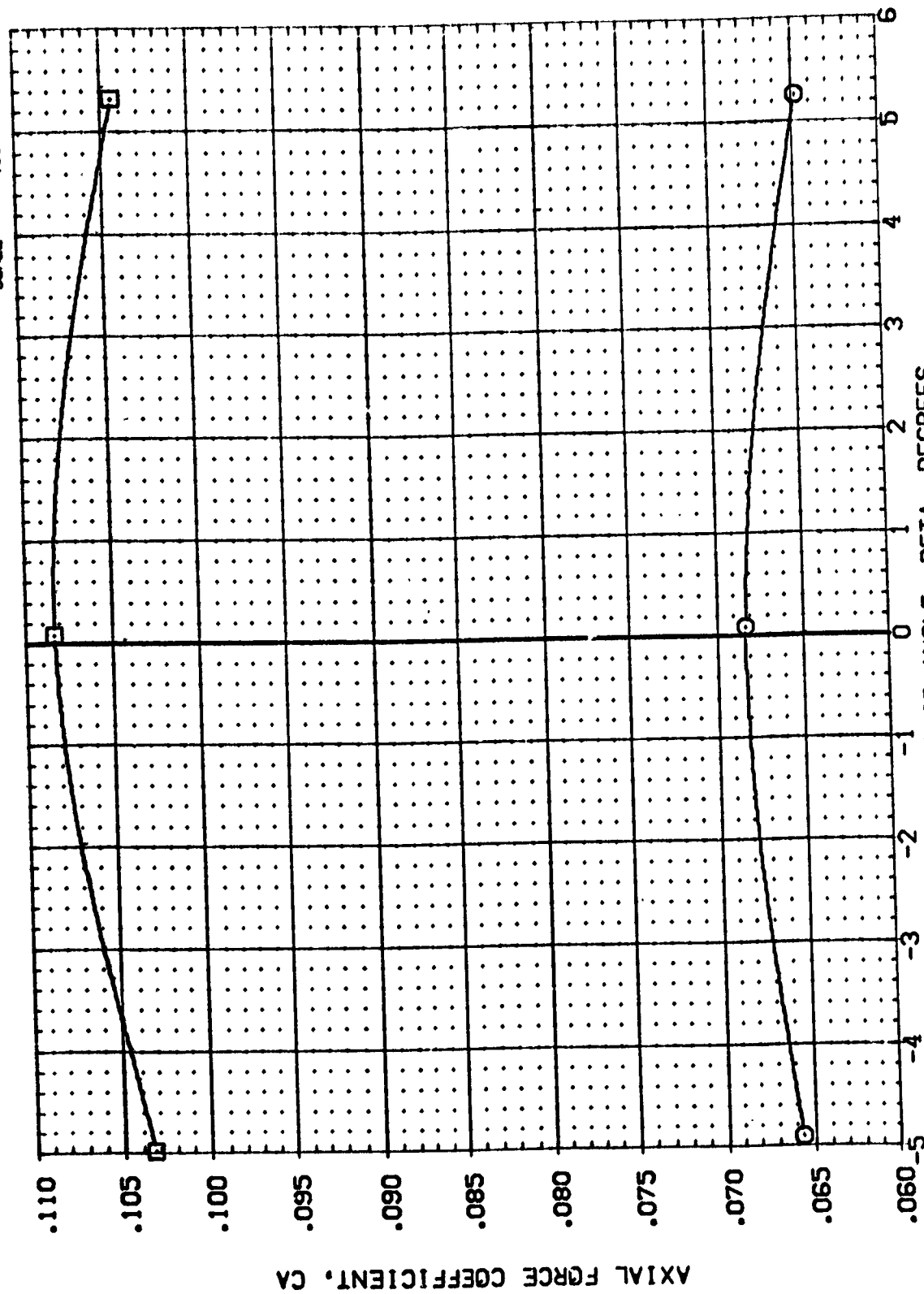


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600,0.899

(RBP027)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		ELEVON	-20.000	RUDFLR	.000
		ALPHA	RUDDER				
□	.600						
○	.899						

REFERENCE INFORMATION

SREF	2.4210	SQ.FT.
LREF	39.8490	
BREF	39.8490	
XREF	32.3000	
YREF	.0000	
ZREF	.0000	
SCALE	.0300	

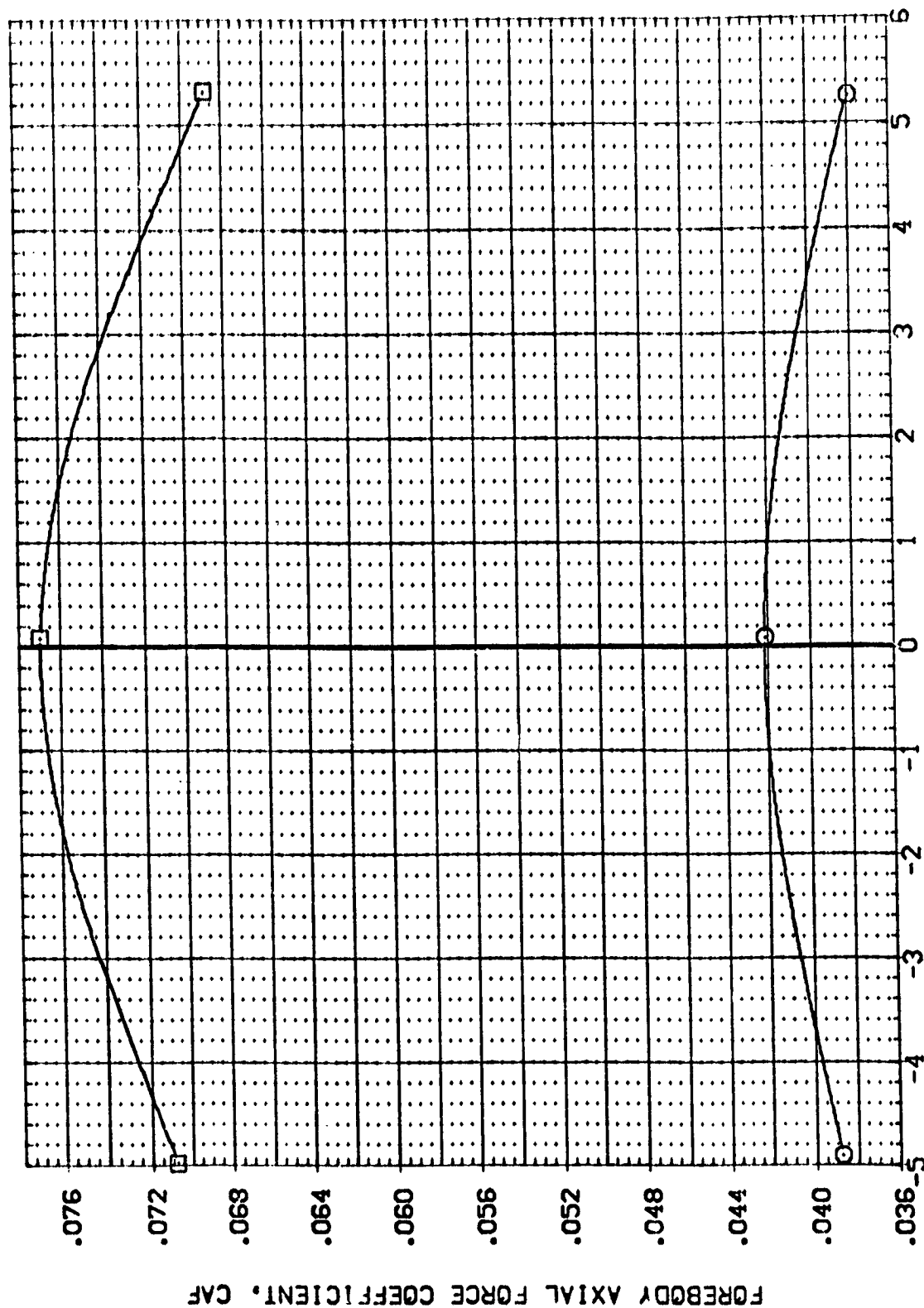


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600,0.899

(RBP027)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .600 .899
□ .000 .000

PARAMETRIC VALUES
ELEVON -20.000
RUDDER .000

REFERENCE INFORMATION
SREF 2.4210 SQ. FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XREF 32.3000 IN.
YREF .0000 IN.
ZREF .0000 IN.
SCALE .0300

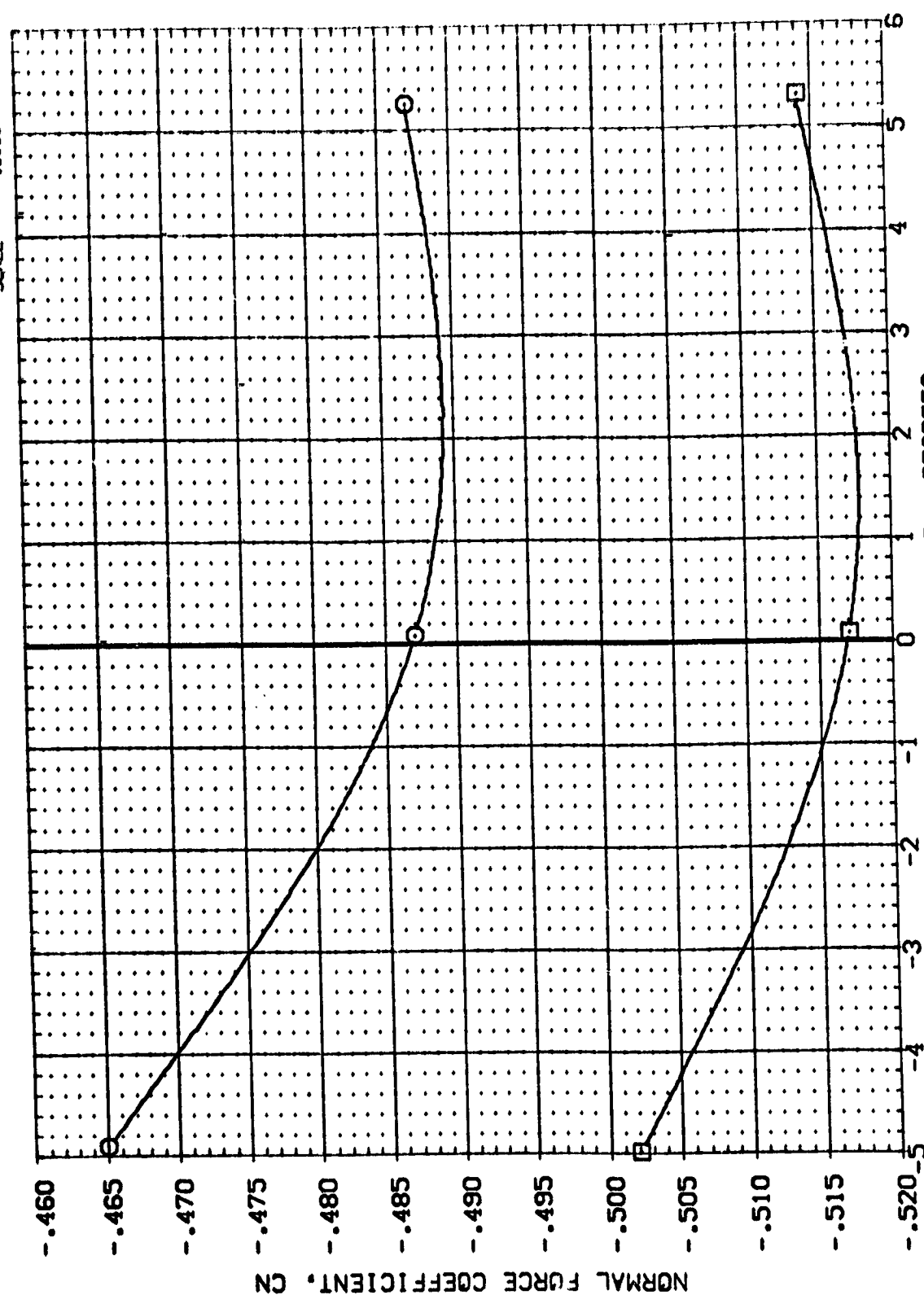


FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.899

AMES 11-707 CA12 02A

(RBP027)

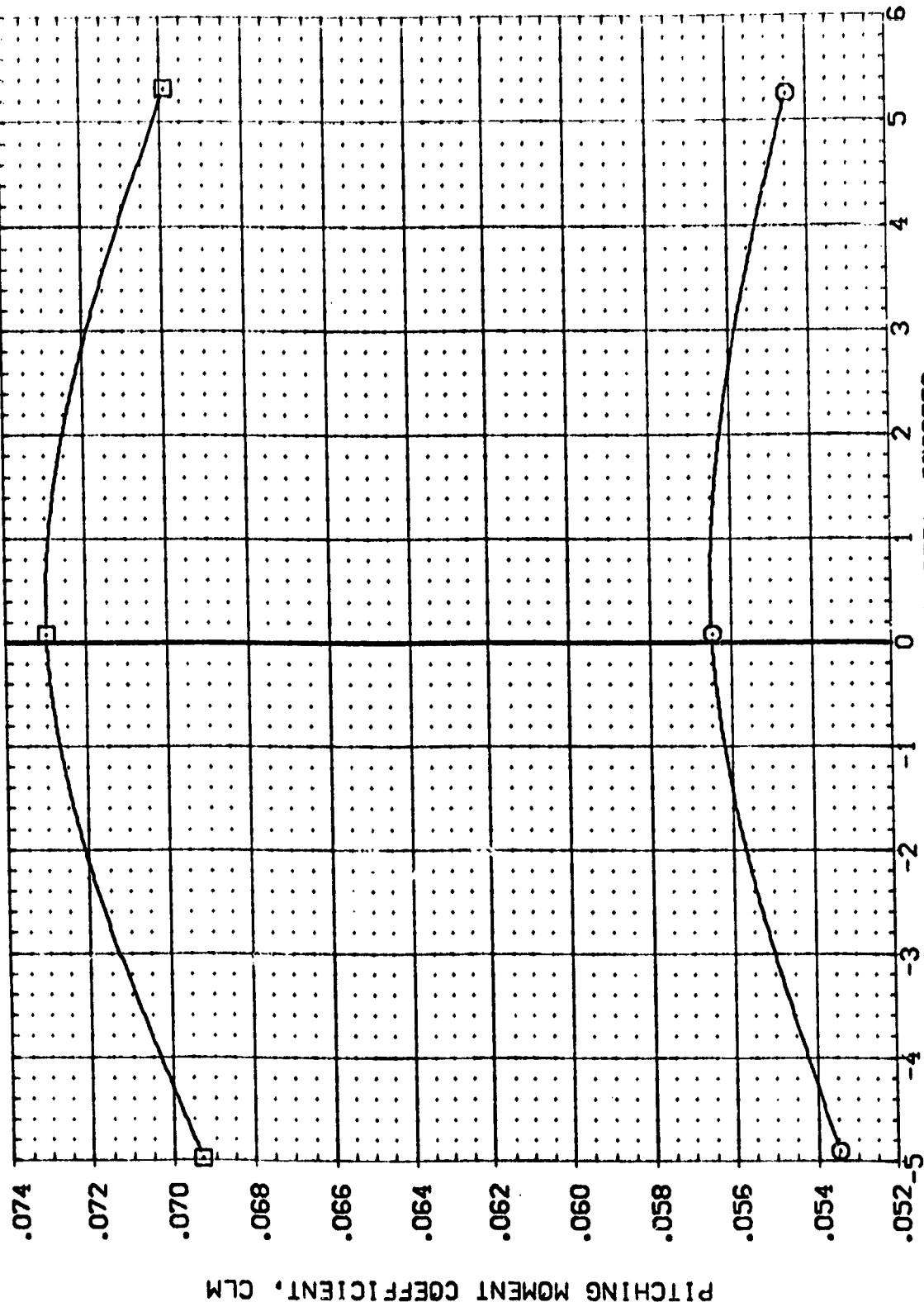
SYM: ☐ ☐

MACH

ALPHA
RUDER

PARAMETRIC VALUES
-4.000 ELEVON -20.000
.000 RUFLR

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 35.9490
BREF 38.8450
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600,0.899

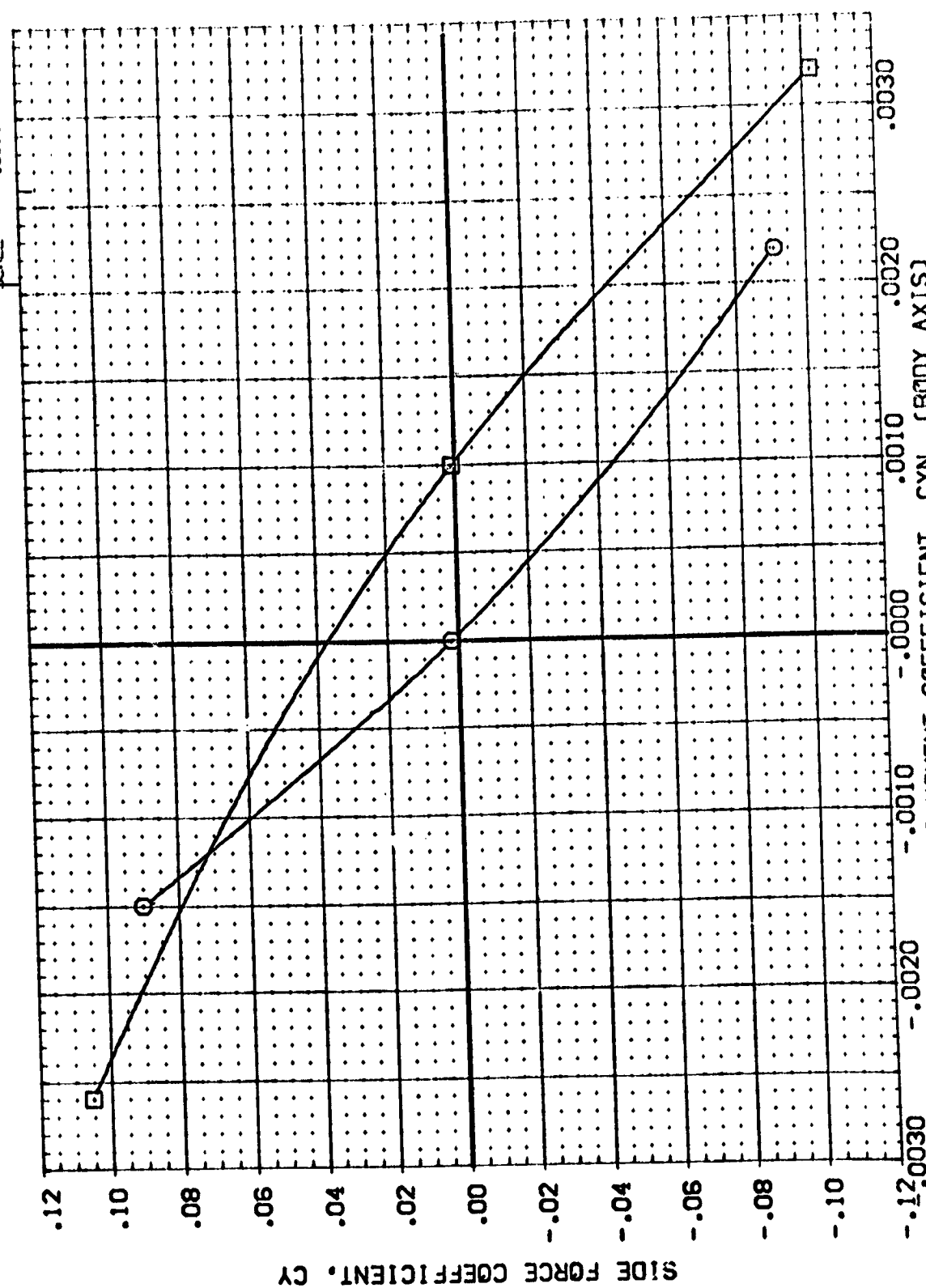
(RBP027)

AYES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .600 .899
 □ .000 .000

PARAMETRIC VALUES
 -4.000 ELEVON -20.000
 .000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8480 IN.
 BREF 36.8480 IN.
 XMR 32.3000 IN.
 YMR .0000 IN.
 ZMR .0000 IN.
 SCALE .0300



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

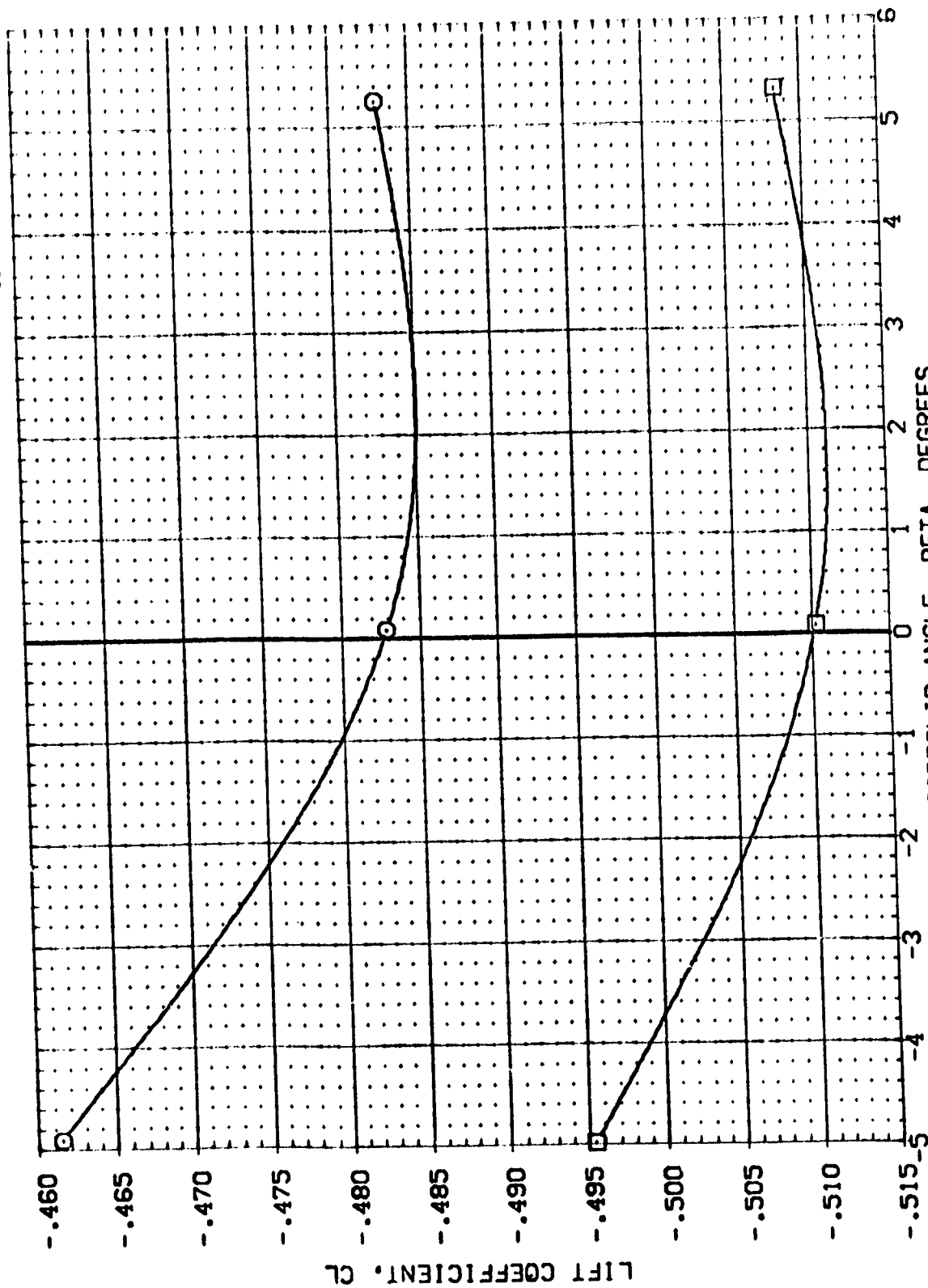
FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MNFO.600,0.899

(ABP027)

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
-20.000 ELEVON
-4.000 RADFLR
.000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8450
BREF 38.8450
XMOD 32.0000
YMOD 0.0000
ZMOD 0.0000
SCALE 10300



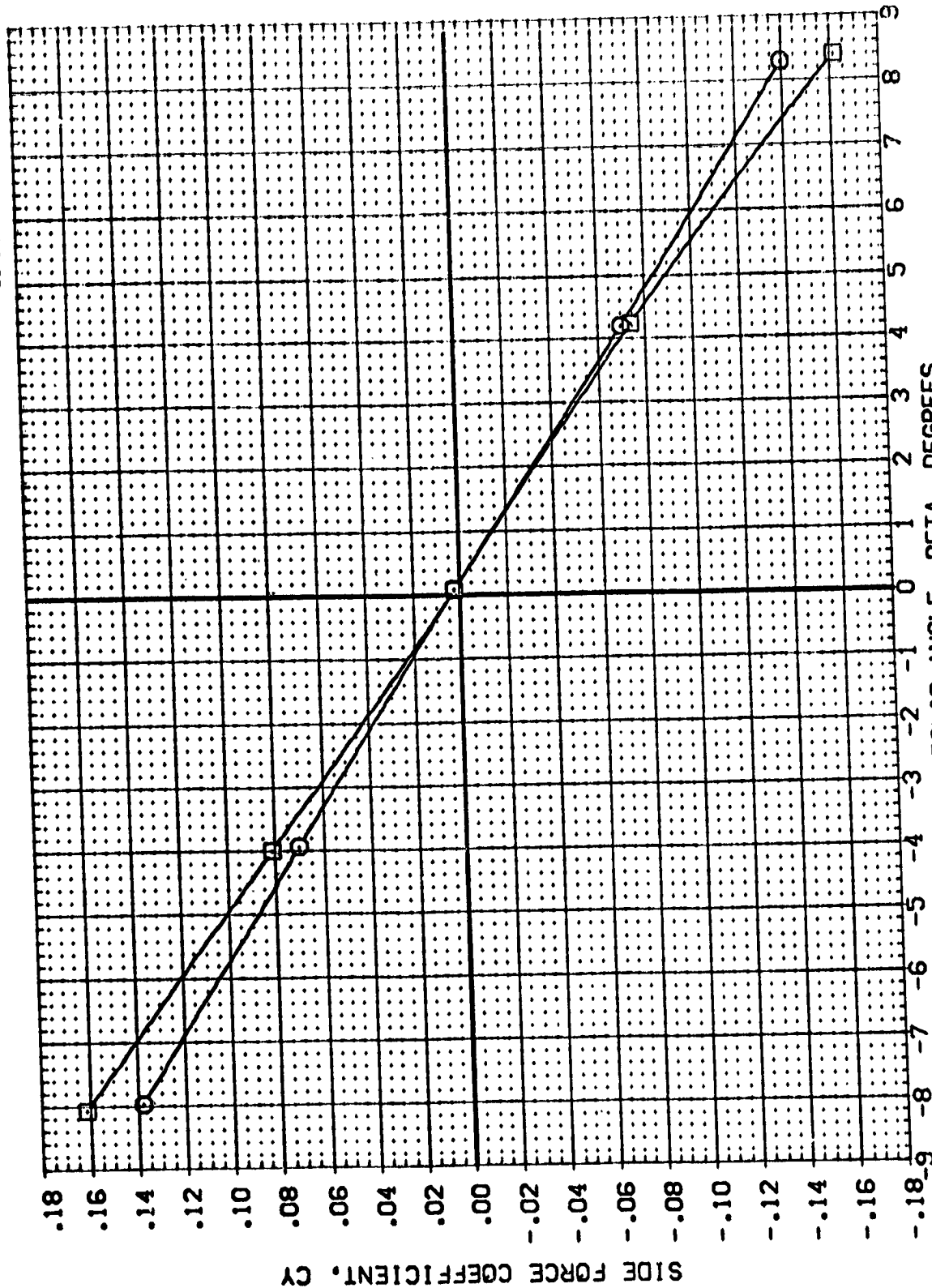
SIDESLIP ANGLE, BETA, DEGREES
FIG.30 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.899
PAGE 242

(RBP028)

AMES 11-907 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR
 ○ .598 .000 .000
 □ .900 .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8450 IN.
 BREF 39.8450 IN.
 XREF 32.3000 IN.
 YREF 0.0000 IN.
 ZREF 0.0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

AMES 11-707 0A12 02A

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ALPHA
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LR

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432X
 432B
 432A
 432S

2.42
2.84
2.84
2.30

8222

REF	2	4210	5
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REF	36	8450	5
REF	37	8450	5
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REF	100	8450	5

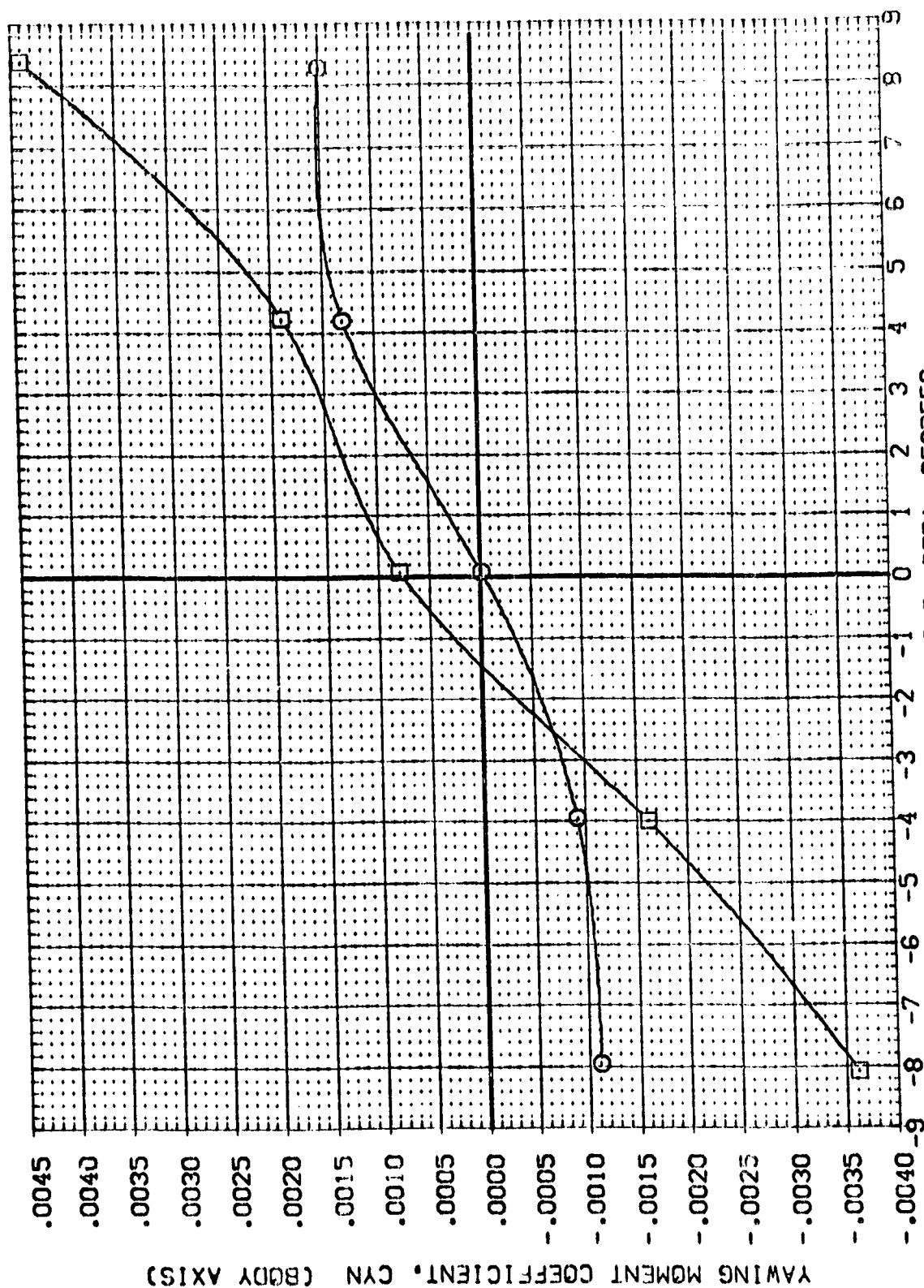


FIG. 31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

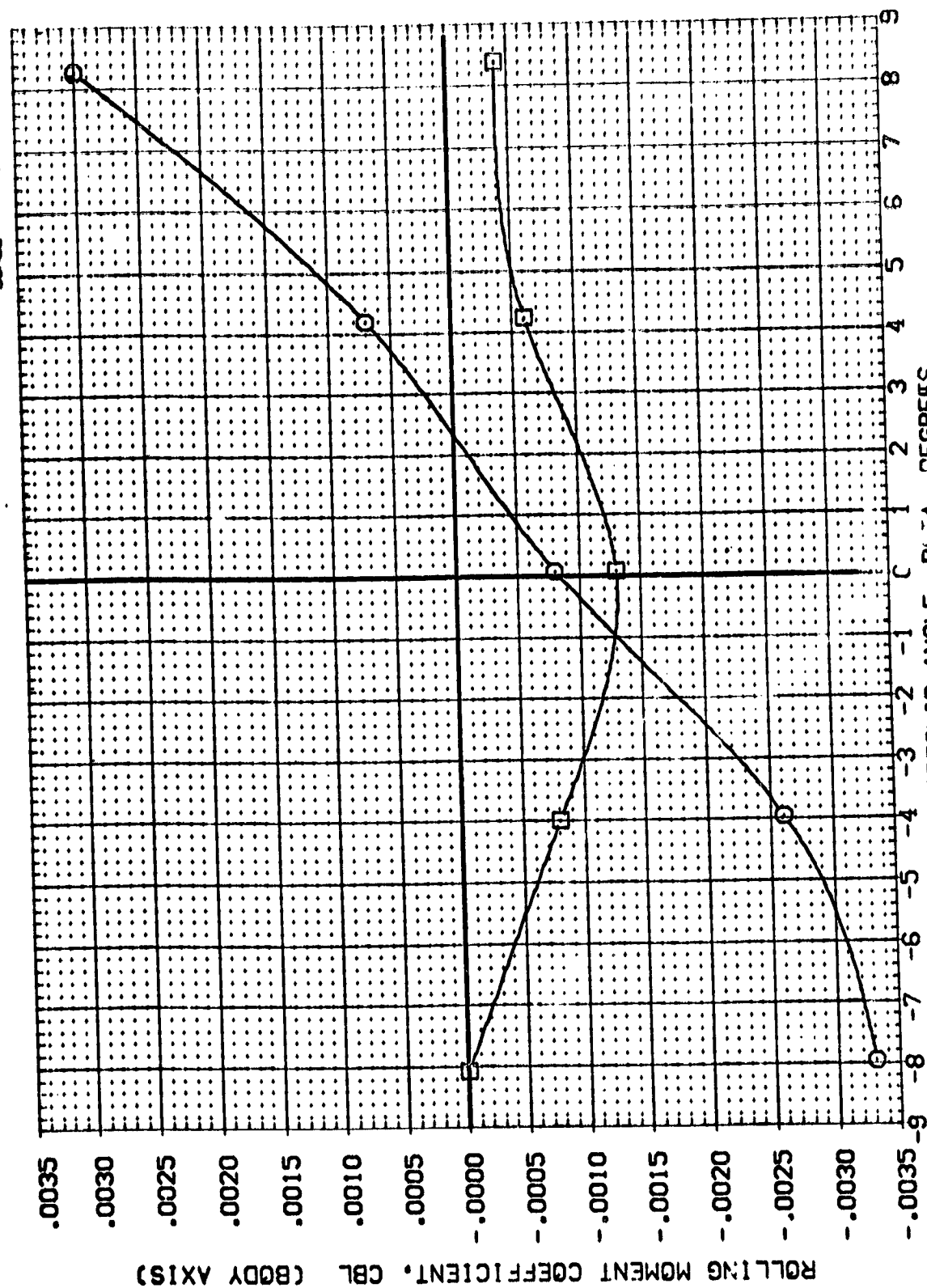
(RBP028)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	.598	FLUDER	.000 ELEVON -20.000
□	.900	FLUDER	.000 RUOFLR .000

REFERENCE INFORMATION

SREF	2.4210	SG.FT.
LREF	38.8450	IN.
BREF	38.8450	IN.
XREF	32.3000	IN.
YREF	.0000	IN.
ZREF	.0000	IN.
SCALE	.0000	IN.



SIDESLIP ANGLE, BETA, DEGREES

FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598,0.900

(RBPJ28)

AMES 11-707 0A12 02A

PARAMETRIC VALUES
MACH .598 ALPHA .000 ELEVON -20.000
RUDDER .000 RUFLR .000

REFERENCE INFORMATION
SREF 2.4210 SS.FT.
LREF 39.8190
BREF 39.8190
XREF 32.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.000

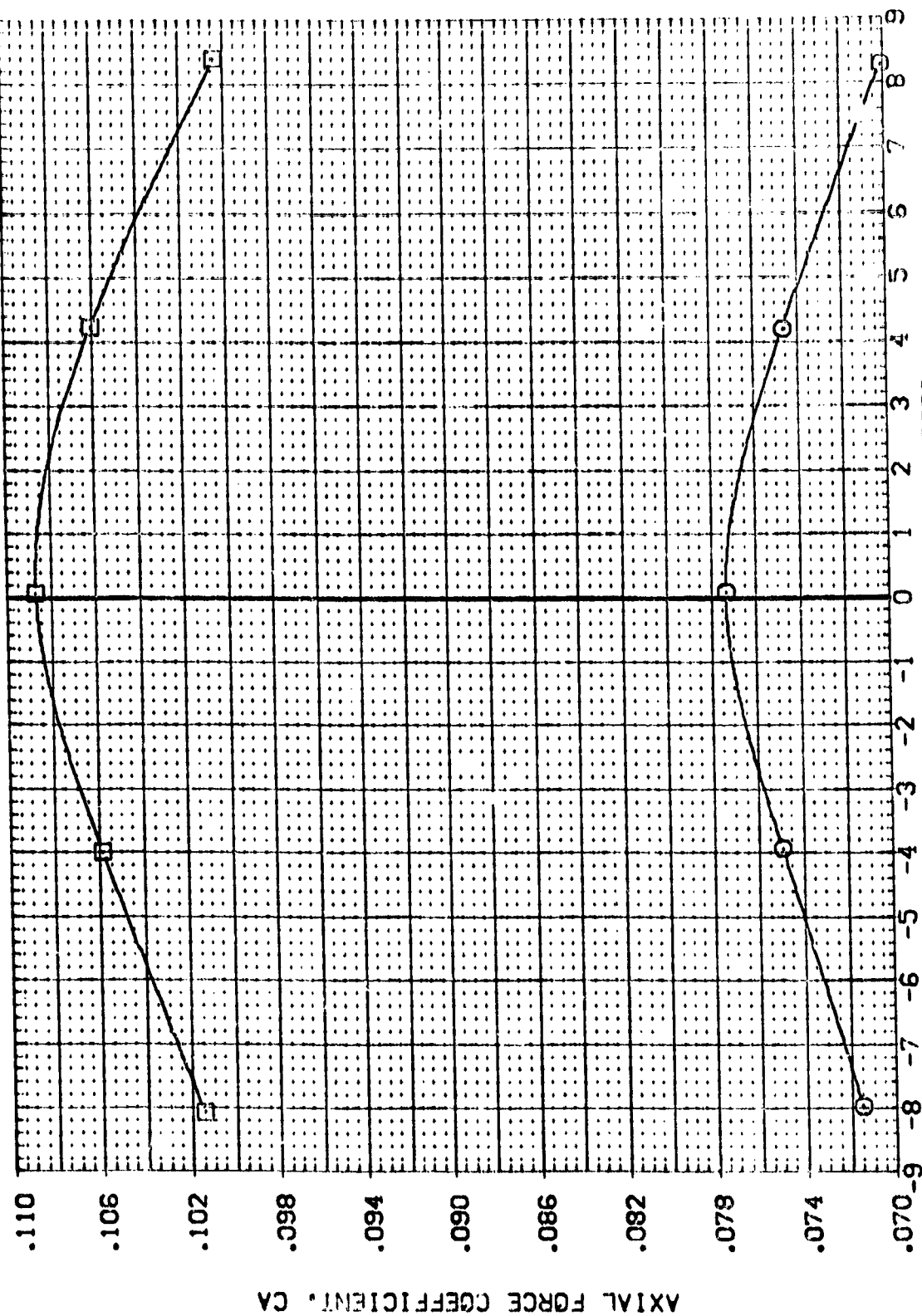


FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

(RBP028)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES	
		ALPHA	ELEVON
□	.598	.000	-20.000
□	.900	.000	.000

REFERENCE INFORMATION

SRF	2.4210	SQ. FT.
LREF	39.8450	IN.
BRF	39.8450	IN.
XRFP	37.3000	IN.
VRFP	1.0000	IN.
ZRFP	1.0000	IN.
SCALE	.0300	SCALE

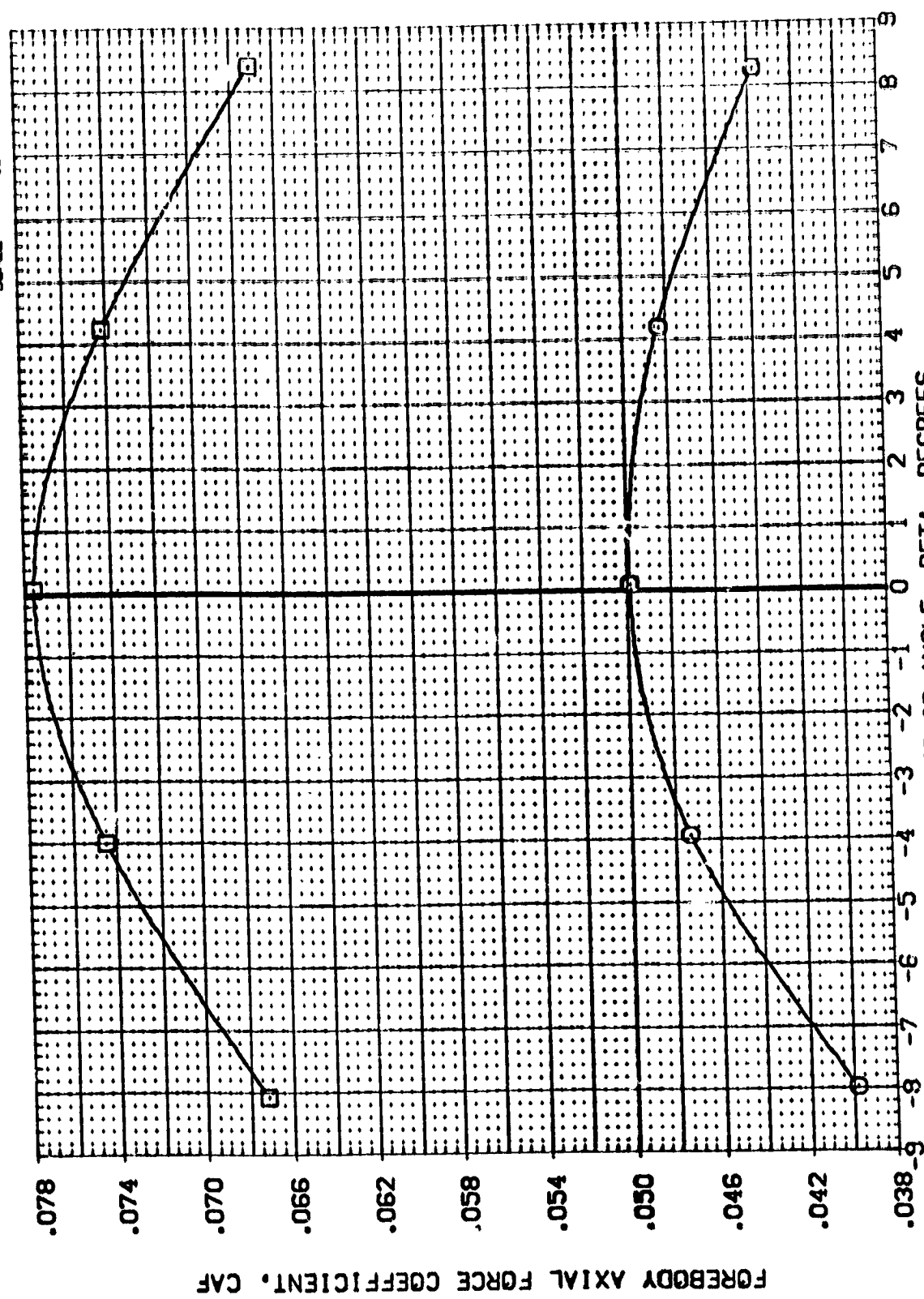
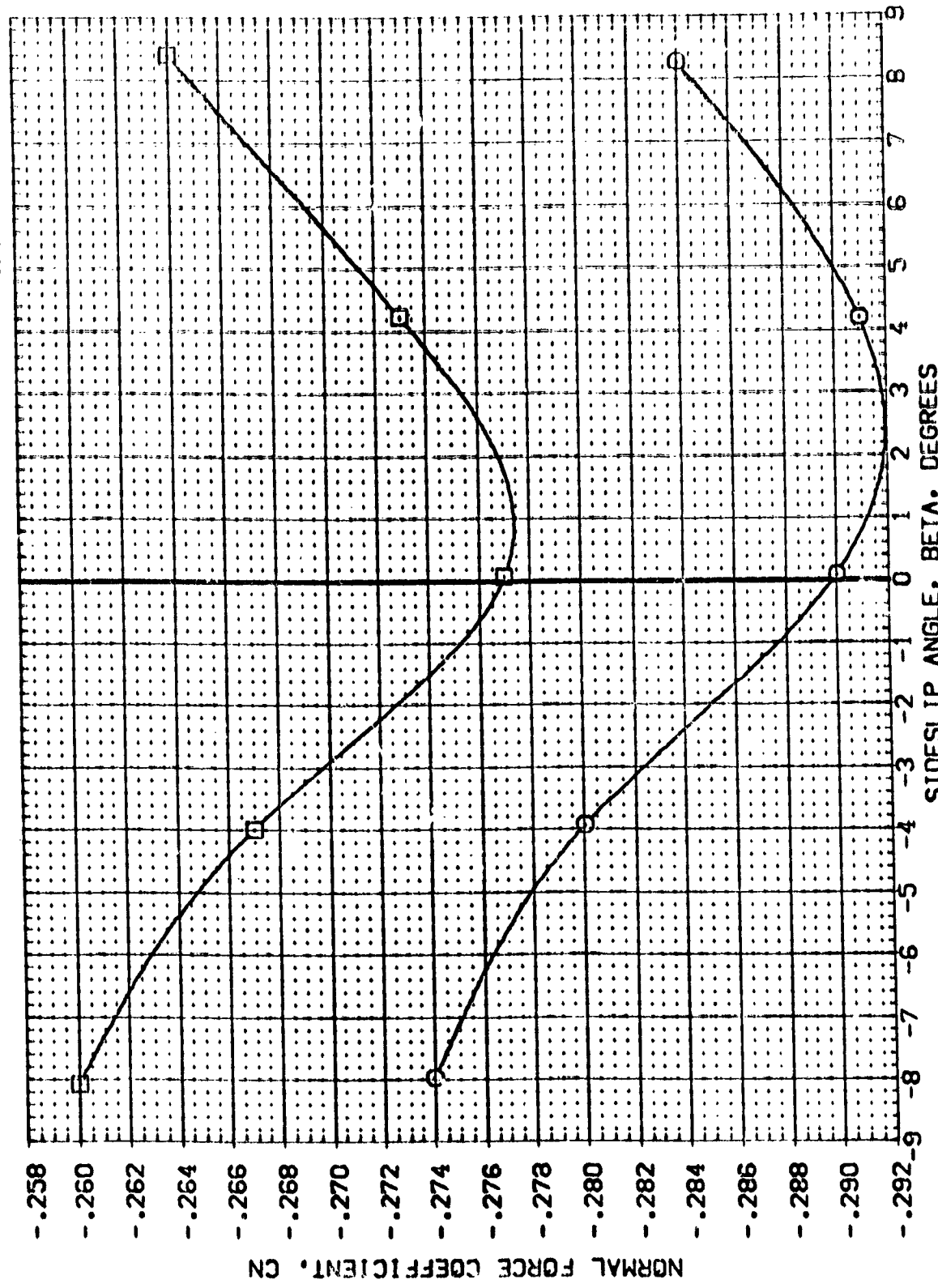


FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

(R8PC28)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.598	RUDER	.000 ELEVON	2.4210
□	.970		.000 RUOFLR	28.2590
			-20.000	28.5450
			.000	27.3000
				27.1000
				27.0000
				26.9000
				26.8000
				26.7000
				26.6000
				26.5000
				26.4000
				26.3000
				26.2000
				26.1000
				26.0000
				25.9000
				25.8000
				25.7000
				25.6000
				25.5000
				25.4000
				25.3000
				25.2000
				25.1000
				25.0000
				24.9000
				24.8000
				24.7000
				24.6000
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				24.4000
				24.3000
				24.2000
				24.1000
				24.0000
				23.9000
				23.8000
				23.7000
				23.6000
				23.5000
				23.4000
				23.3000
				23.2000
				23.1000
				23.0000
				22.9000
				22.8000
				22.7000
				22.6000
				22.5000
				22.4000
				22.3000
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				22.1000
				22.0000
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				21.5000
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				20.4000
				20.3000
				20.2000
				20.1000
				20.0000
				19.9000
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				15.3000
				15.2000
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				14.5000
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				13.9000
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				9.7000
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				9.4000
				9.3000
				9.2000
				9.1000
				9.0000
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				8.8000
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				8.6000
				8.5000
				8.4000
				8.3000
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				8.1000
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				6.6000
				6.5000
				6.4000
				6.3000
				6.2000
				6.1000
				6.0000
				5.9000
				5.8000
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				5.4000
				5.3000
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				2.6000
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				2.4000
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				1.9000
				1.8000
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				1.6000
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				1.4000
				1.3000
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				1.0000
				0.9000
				0.8000
				0.7000
				0.6000
				0.5000
				0.4000
				0.3000
				0.2000
				0.1000
				0.0000
				-0.1000
				-0.2000
				-0.3000
				-0.4000
				-0.5000
				-0.6000
				-0.7000
				-0.8000
				-0.9000
				-1.0000
				-1.1000
				-1.2000
				-1.3000
				-1.4000
				-1.5000
				-1.6000
				-1.7000
				-1.8000
				-1.9000
				-2.0000
				-2.1000
				-2.2000
				-2.3000
				-2.4000
				-2.5000
				-2.6000
				-2.7000
				-2.8000
				-2.9000
				-3.0000
				-3.1000
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				-3.3000
				-3.4000
				-3.5000
				-3.6000
				-3.7000
				-3.8000
				-3.9000
				-4.0000
				-4.1000
				-4.2000
				-4.3000
				-4.4000
				-4.5000
				-4.6000
				-4.7000
				-4.8000
				-4.9000
				-5.0000
				-5.1000
				-5.2000
				-5.3000
				-5.4000
				-5.5000
				-5.6000
				-5.7000
				-5.8000
				-5.9000
				-6.0000
				-6.1000
				-6.2000
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				-7.5000
				-7.6000
				-7.7000
				-7.8000
				-7.9000
				-8.0000
				-8.1000
				-8.2000
				-8.3000
				-8.4000
				-8.5000
				-8.6000
				-8.7000
				-8.8000
				-8.9000
				-9.0000
				-9.1000
				-9.2000
				-9.3000
				-9.4000
				-9.5000
				-9.6000
				-9.7000
				-9.8000
				-9.9000
				-10.0000



(RBP028)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .598 .900
 □ .000 .000
 PARAMETRIC VALUES
 ELEVON -20.000
 RUDDLR .000

REFERENCE INFORMATION
 SPEC 2.4210
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 10.0000
 ZREF 1.0000
 SCALE 1.0000

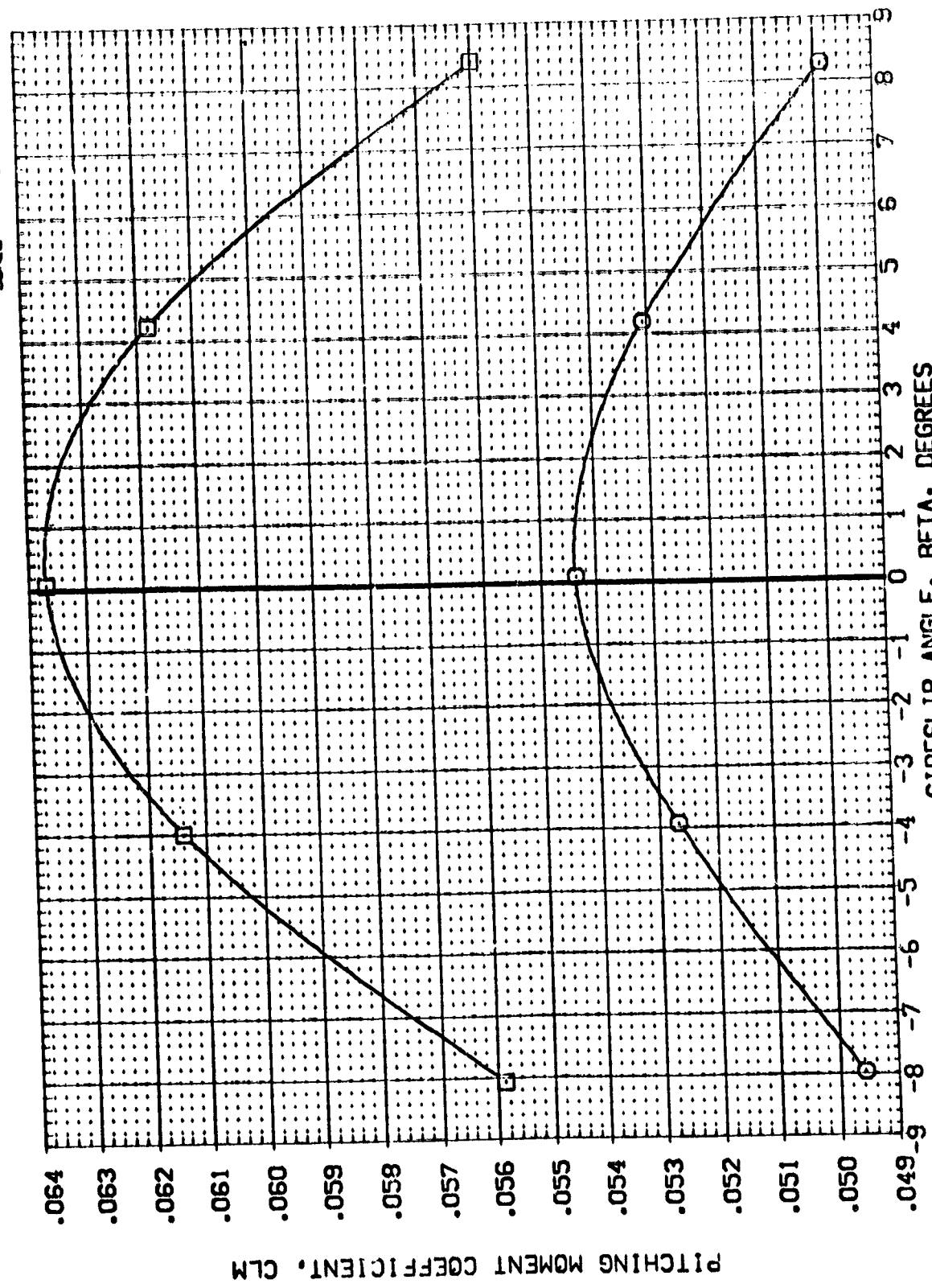


FIG.3.1 ORBITER LAT-OIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

(RBPO28)

AMES 11-707 0A12 02A

SYMBOL
□
○

MACH
.598
.900

ALPHA
RUDDER

PARAMETRIC VALUES
.000 ELEVON
.000 RUDDER

-20.000
.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

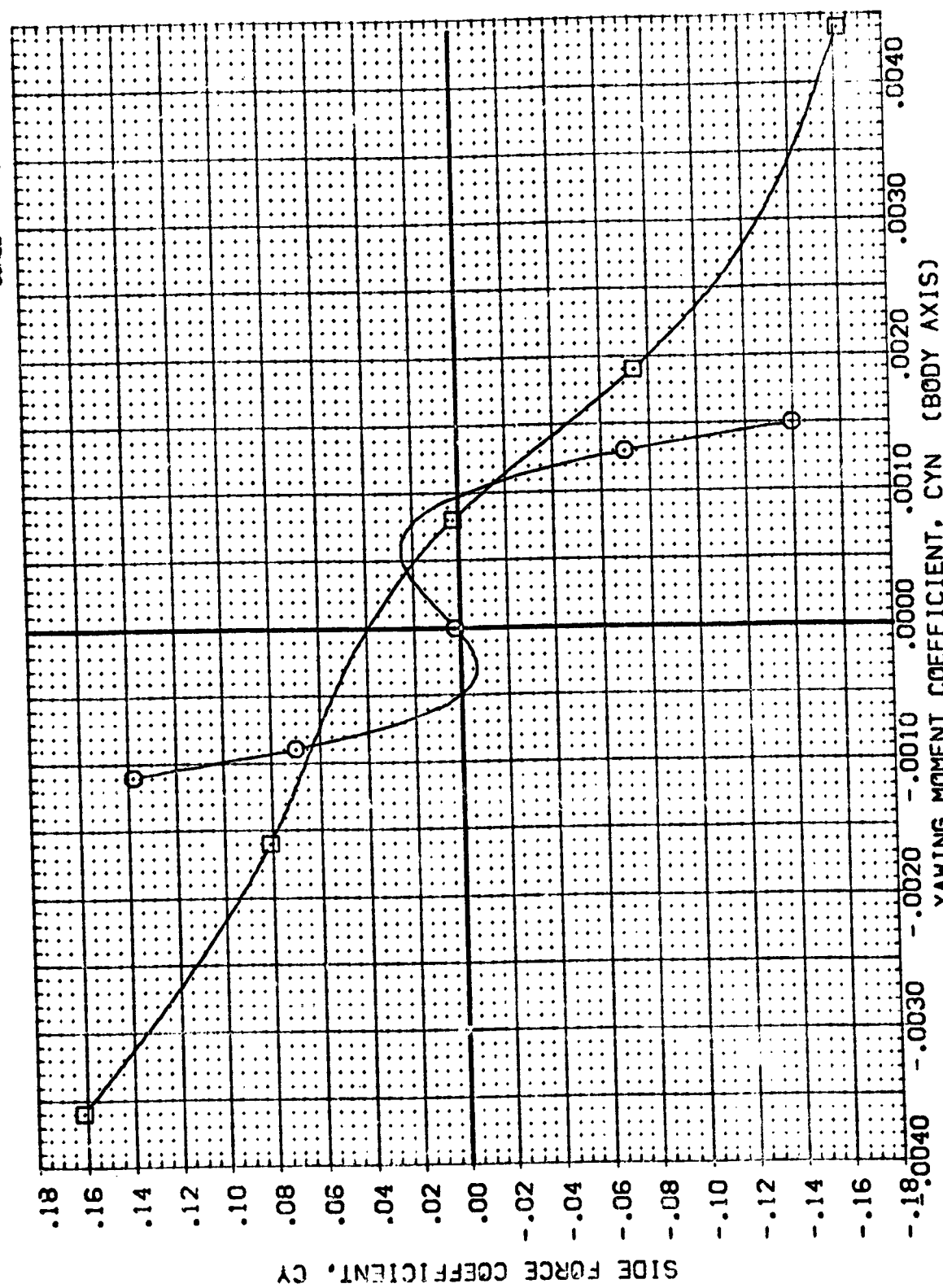


FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.900

(ABP028)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .598
□ .900

PARAMETRIC VALUES
.000 ELEVON
.000 RUOFLR

-20.000
.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

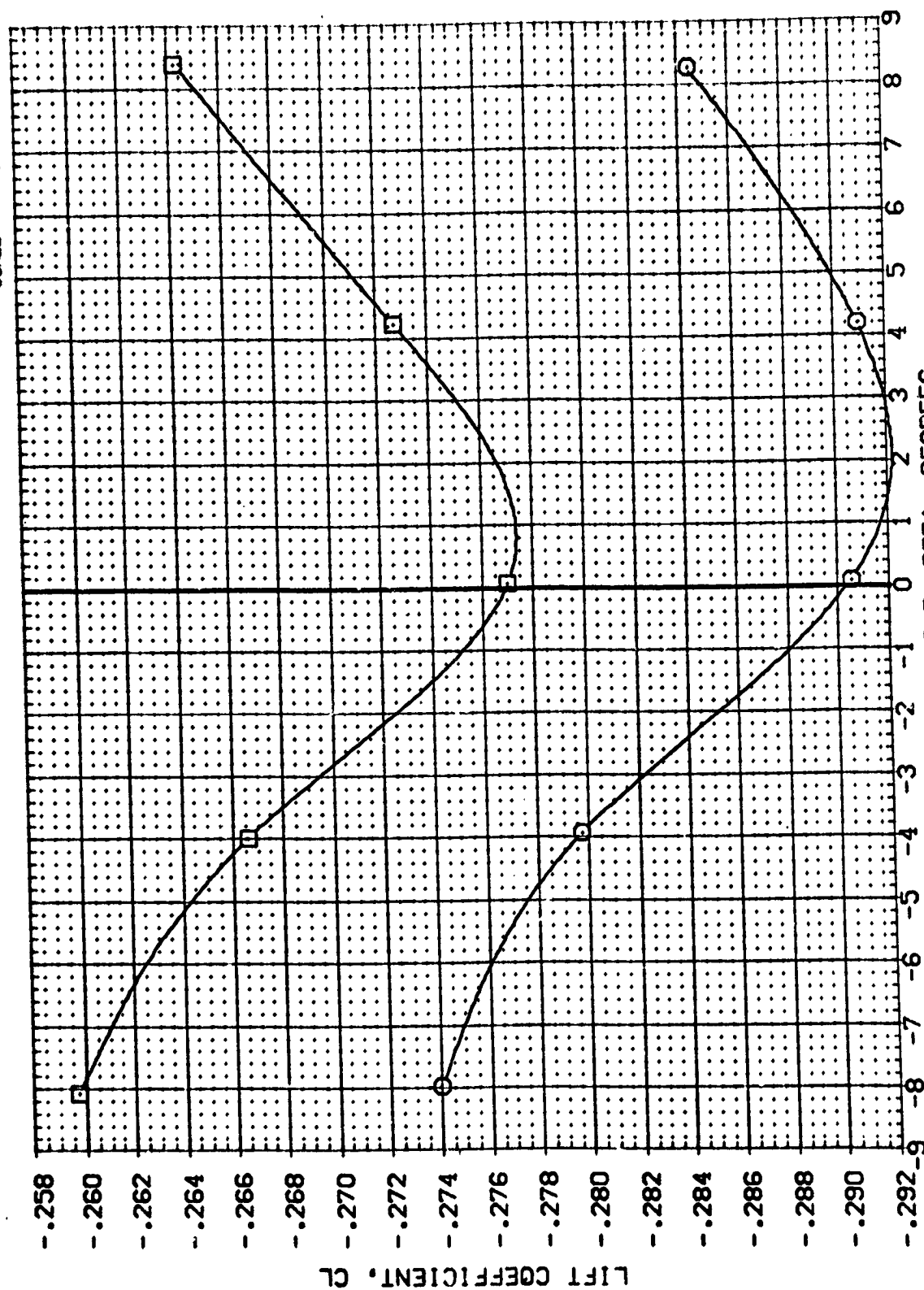


FIG.31 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., ELEVON=-20 DEGS., MN=0.598,0.900

(RBPO29)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.600	.000	ELEVON	SREF 2.4210
○	.895	.000	RUDFLR	LREF 39.8490
				BREF 39.8490
				XMRP 32.3000
				YMRP .0000
				ZMRP .0000
				SCALE .0300

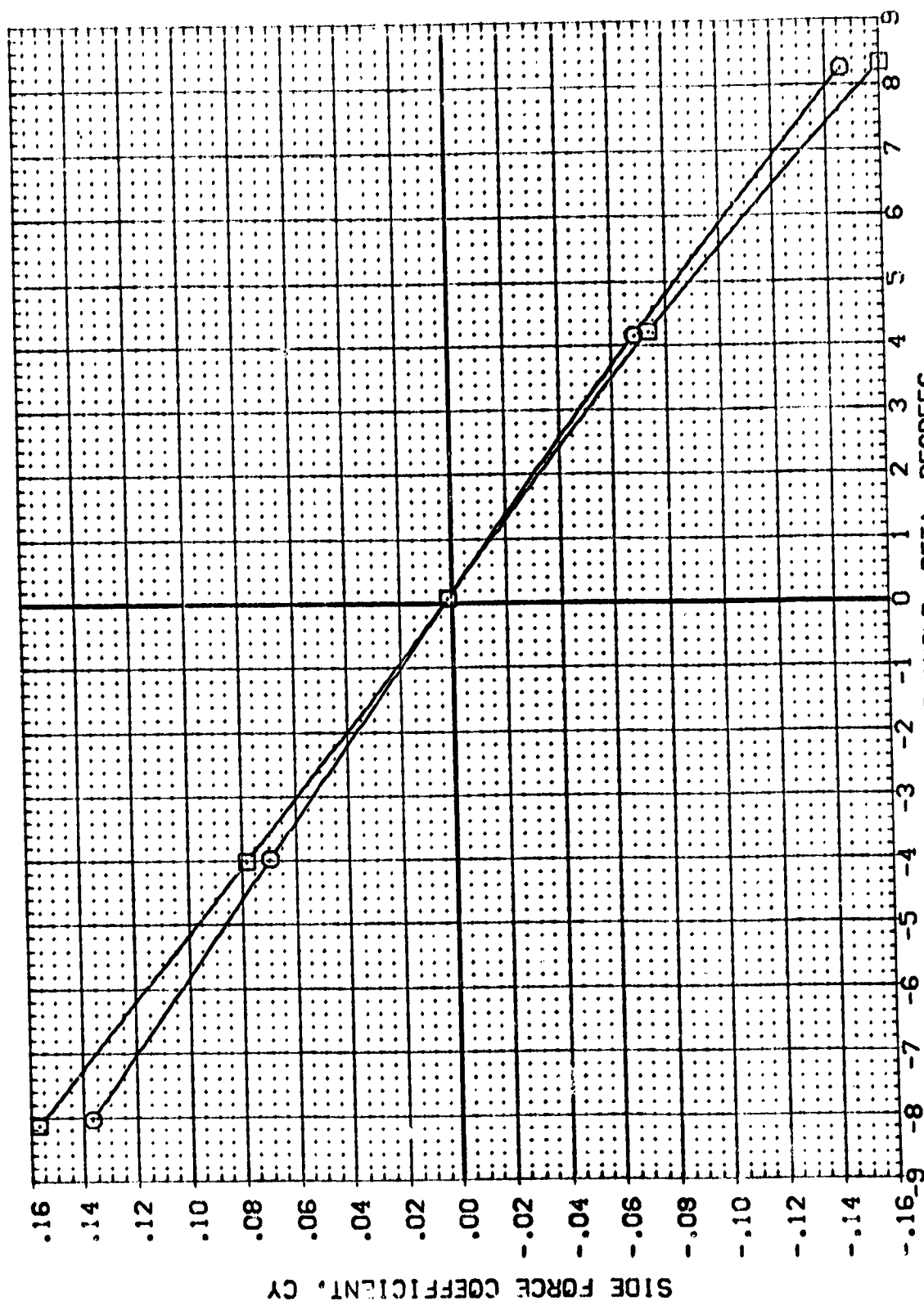


FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600,0.895
PAGE 252

(RBP029)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .896
PARAMETRIC VALUES
ELEVON RUOFLR
5.000 .000
-20.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

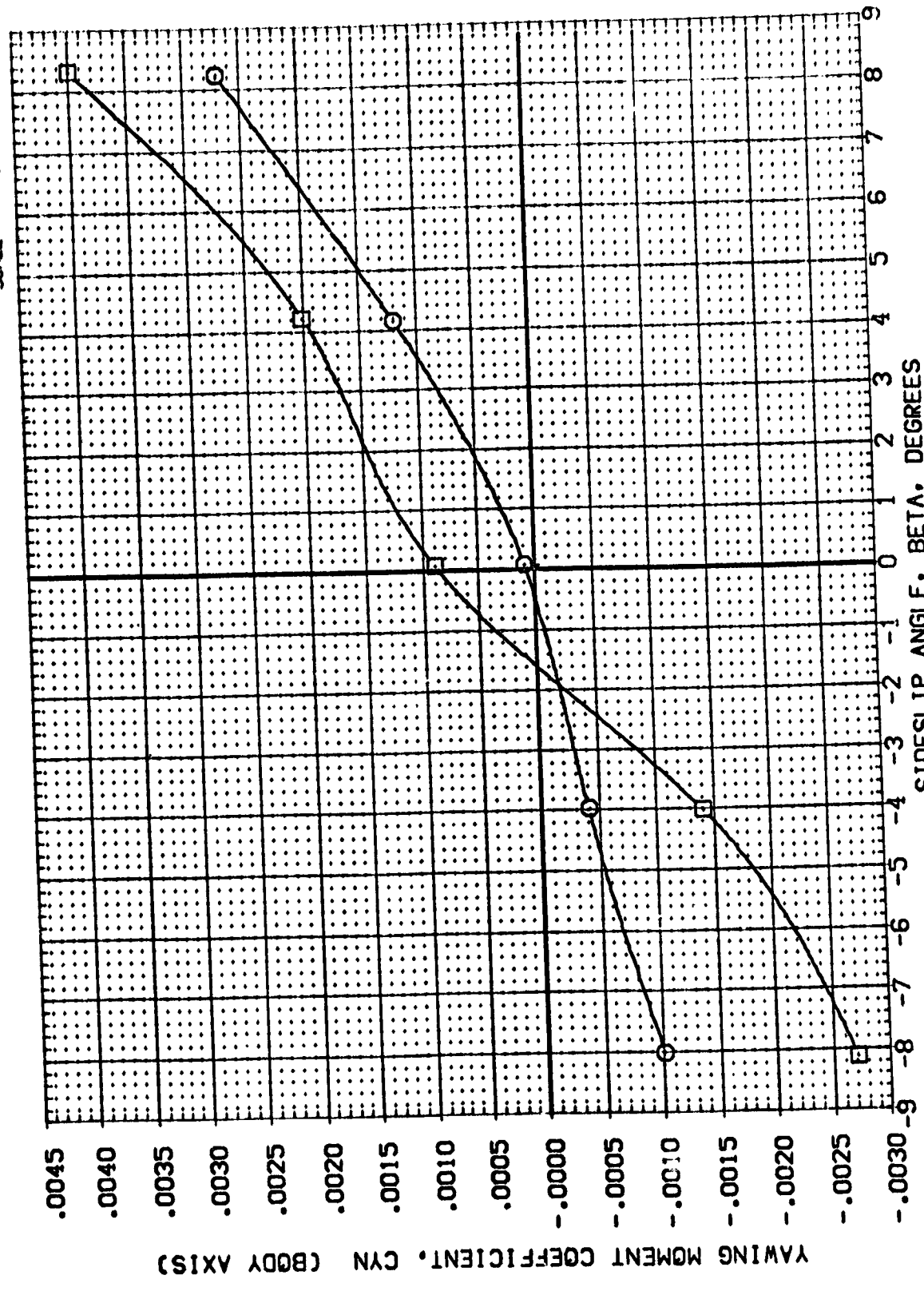


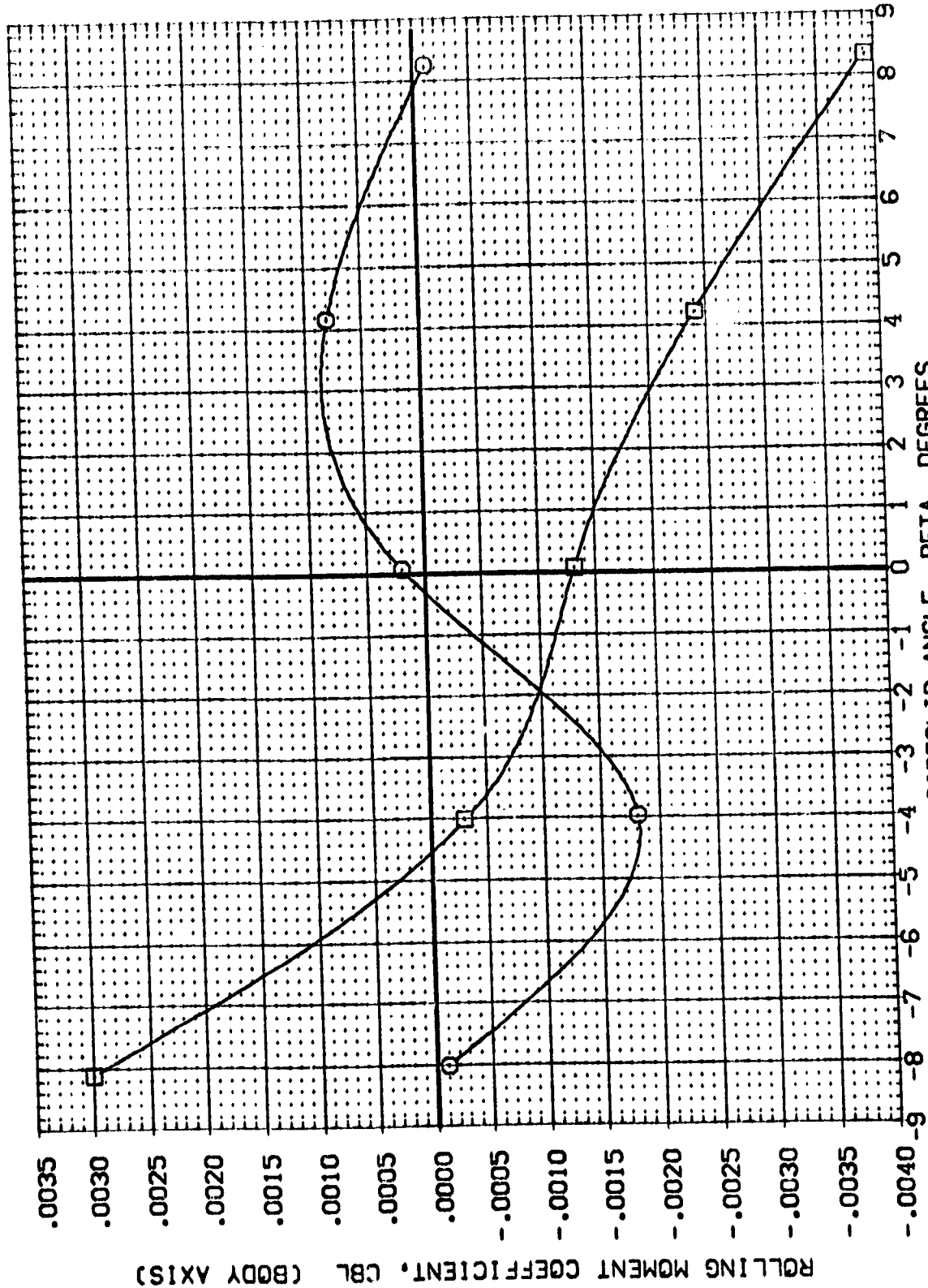
FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.896

(RBPR-29)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDELR
□ .600 .000 .000 -20.000
□ .896 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.8400 IN.
BREF 38.8400 IN.
XREF 32.5000 IN.
YREF 0.0000 IN.
ZREF 0.0000 IN.
SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600,0.896



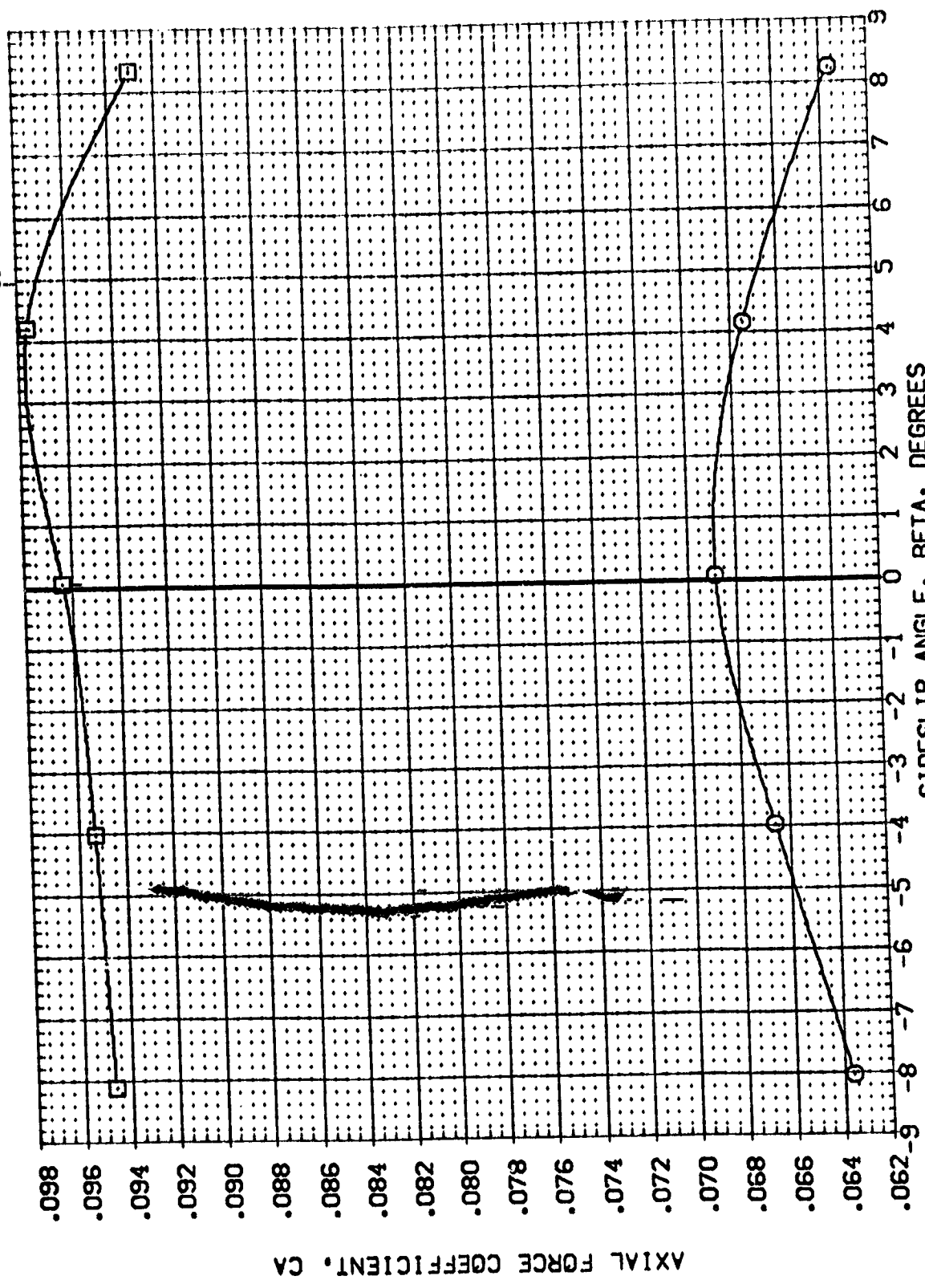
(RBP029)

AMES 11-707 0X12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .896
□ .000 .000

PARAMETRIC VALUES
ELEVON -20.000
RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
X-REF 32.3000 IN.
Y-REF .0000 IN.
Z-REF .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.896

(RBP029)

AMES 11-707 CA12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .896
□ 5.000 .000
□ .000 .000
□ .000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

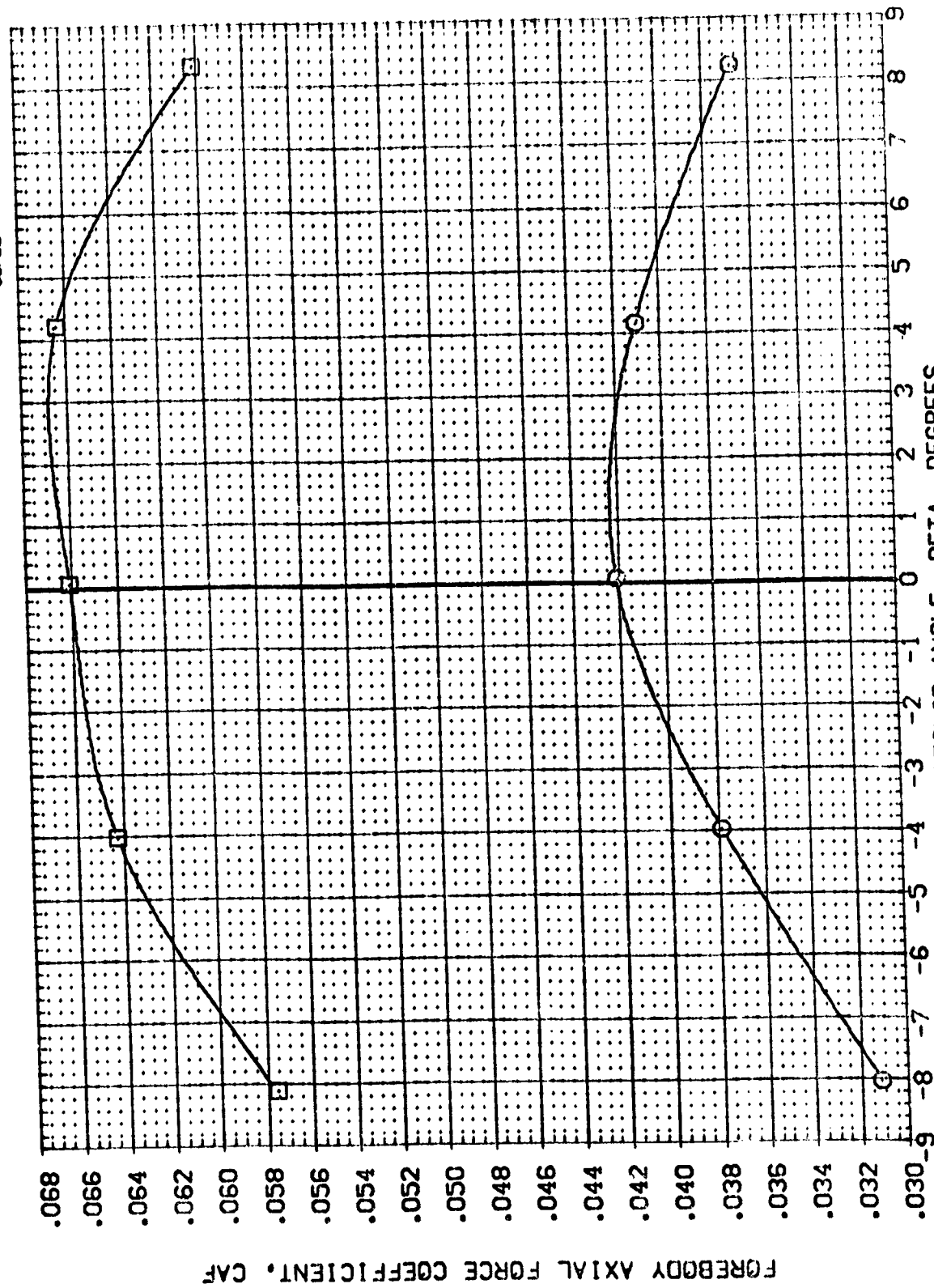


FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.500, 0.896
PAGE 256

(RBP029)

AMES 11-707 0A12 02A

SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
□	.600	RJDDER	5.000 ELEVON -20.000	SREF 2.4210 50.FT.
	.896		.000 RUOFLR .000	LREF 39.8450 IN.
				BREF 39.8450 IN.
				XMREF 32.3000 IN.
				YMREF .0000 IN.
				ZMREF .0000 IN.
				SCALE .0300

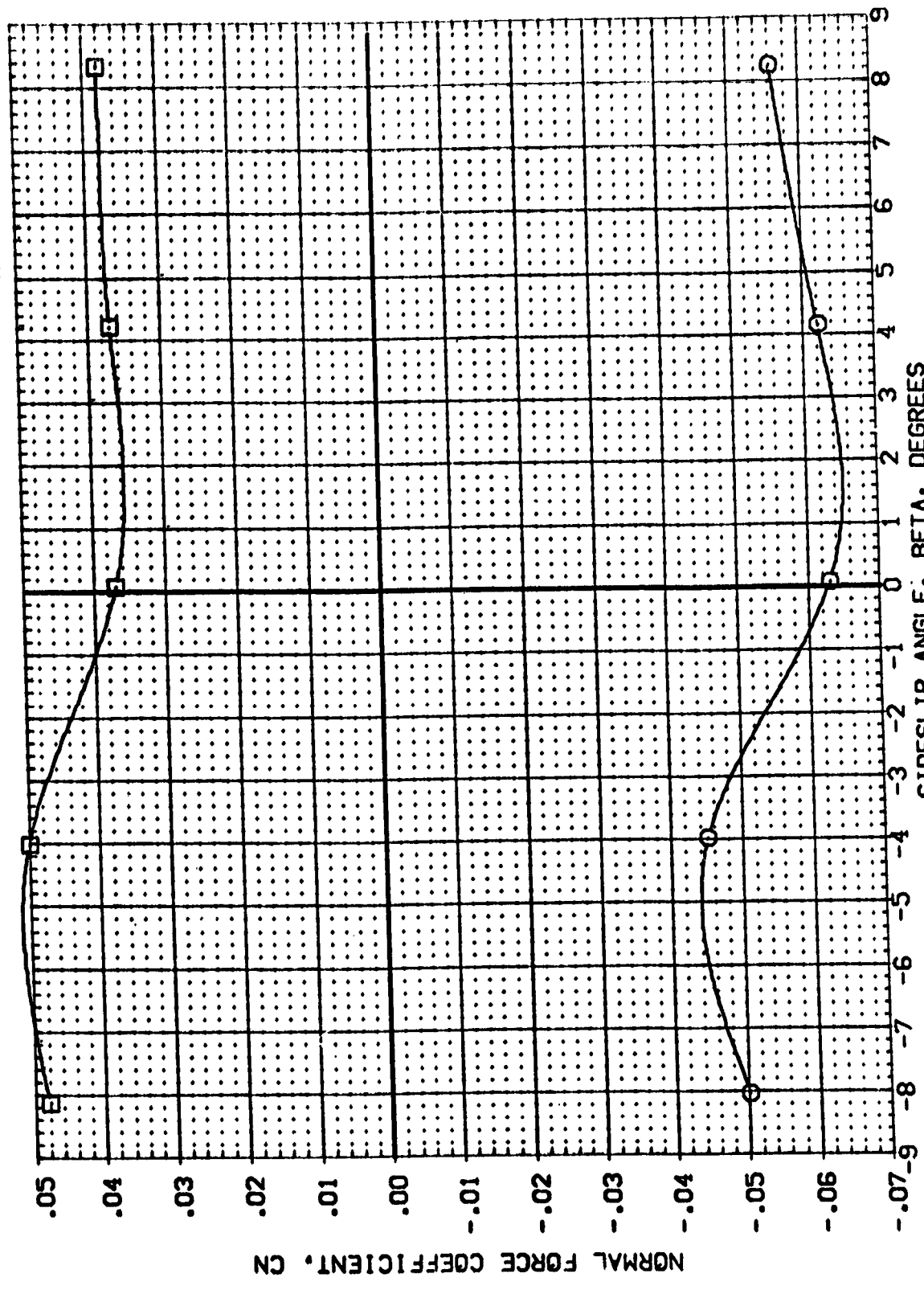


FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600,0.896

(RBP029)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .600 .896
□ 5.000 .000
PARAMETRIC VALUES
ELEVON -20.000
RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

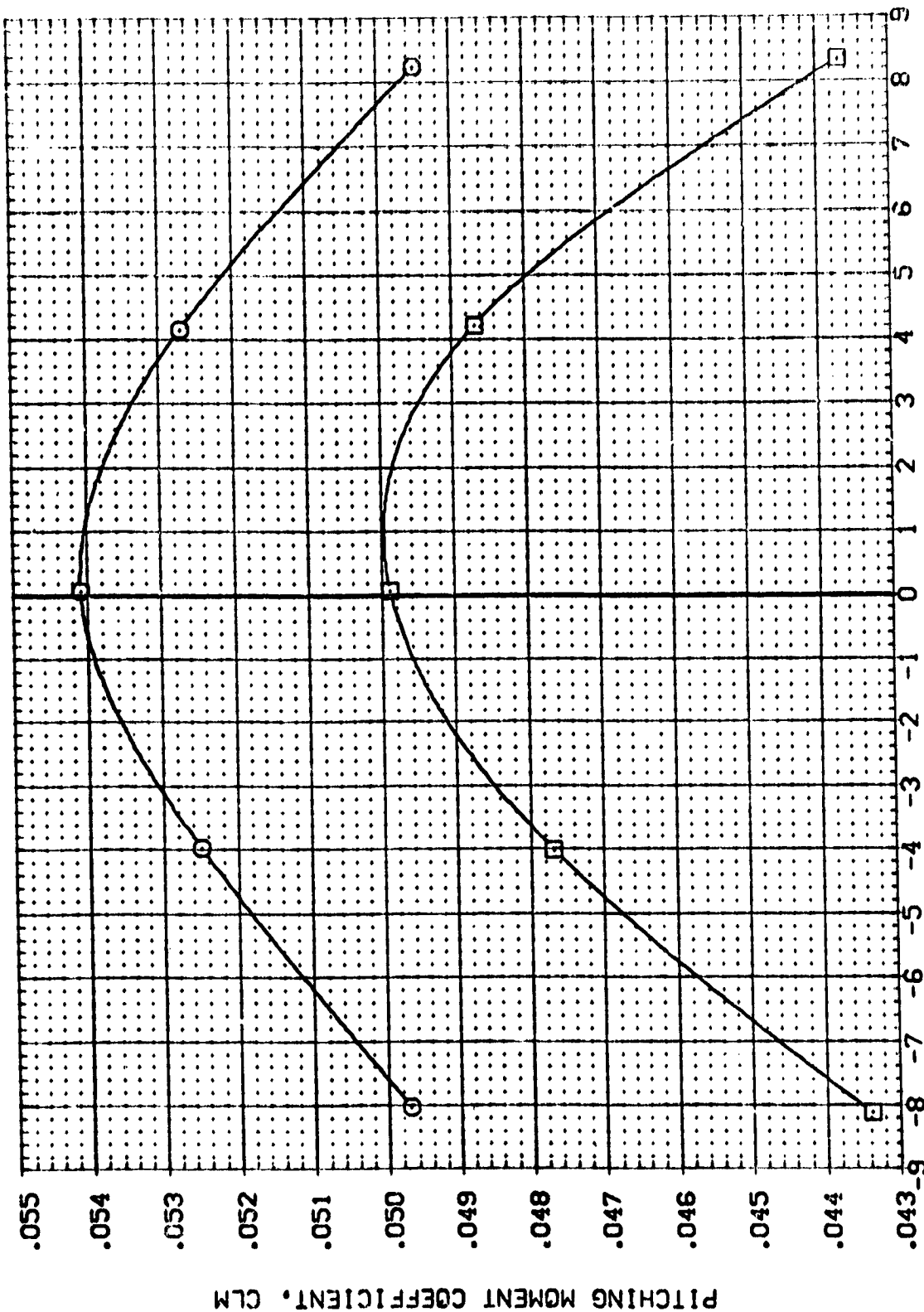


FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.896

[RBP029]

AMES 11-707 0A12 02A

SYMBOL
○ □

MACH
.600
.895

PARAMETRIC VALUES
ALPHA 5.000 ELEVON -20.000
RUDDER .000 RUJFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XPRP 52.8000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

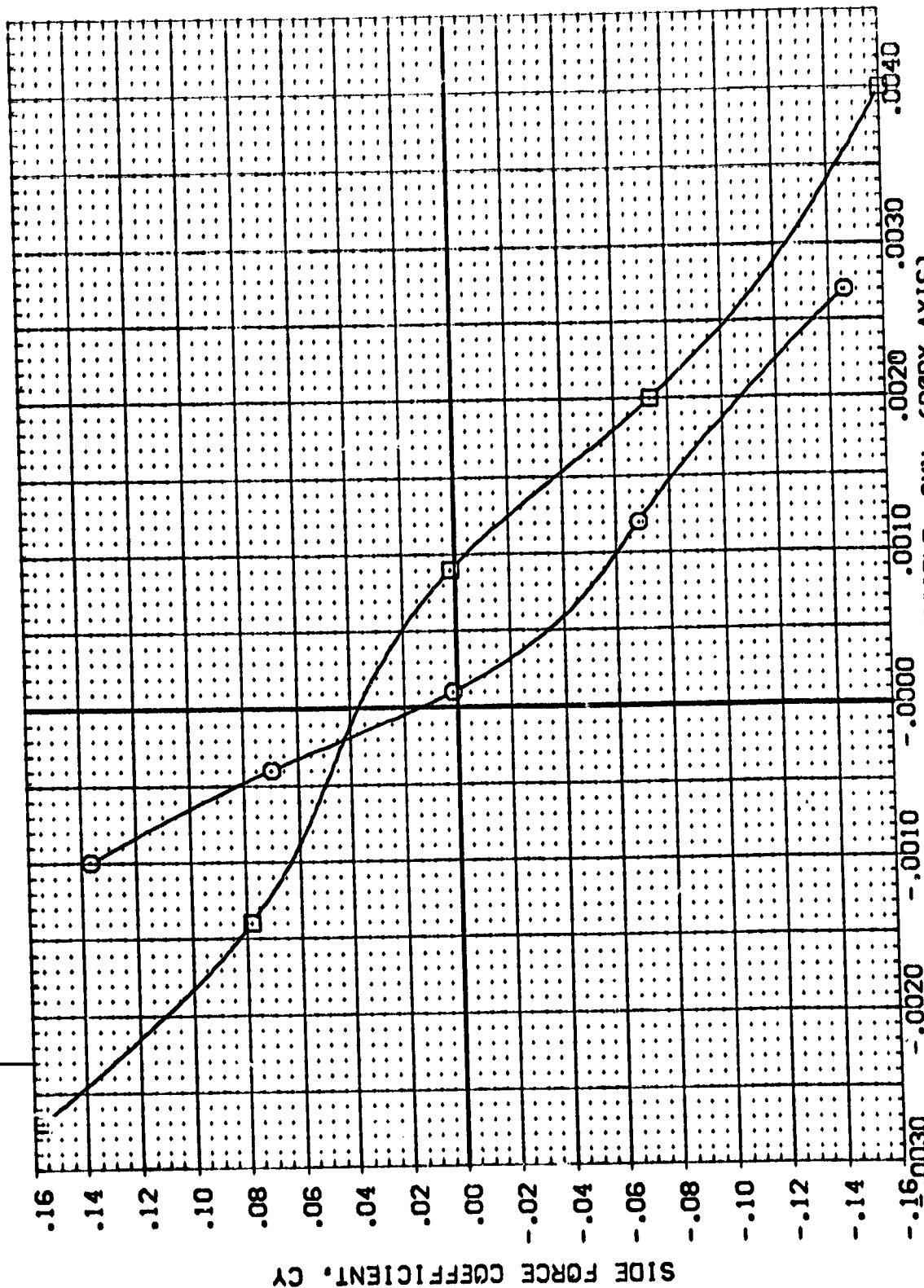


FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600,0.895
PAGE 259

(ABP029)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
REF 38.8450
REF 38.8450
REF 38.8450
XREF 32.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.0000

PARAMETRIC VALUES
MACH .600 ALPHA 5.000 ELEVON -20.000
RUDER .000 RUOFLR .000

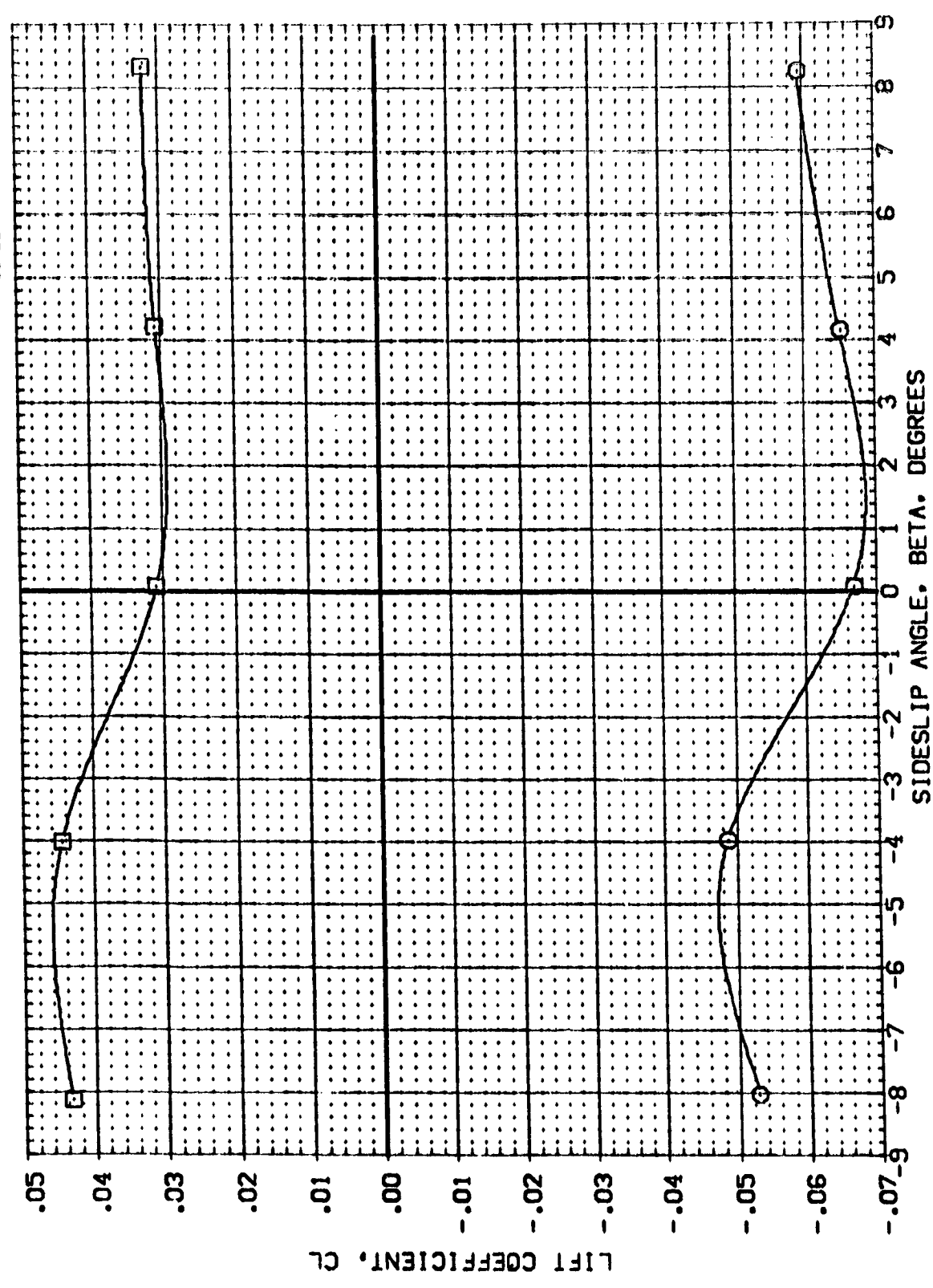


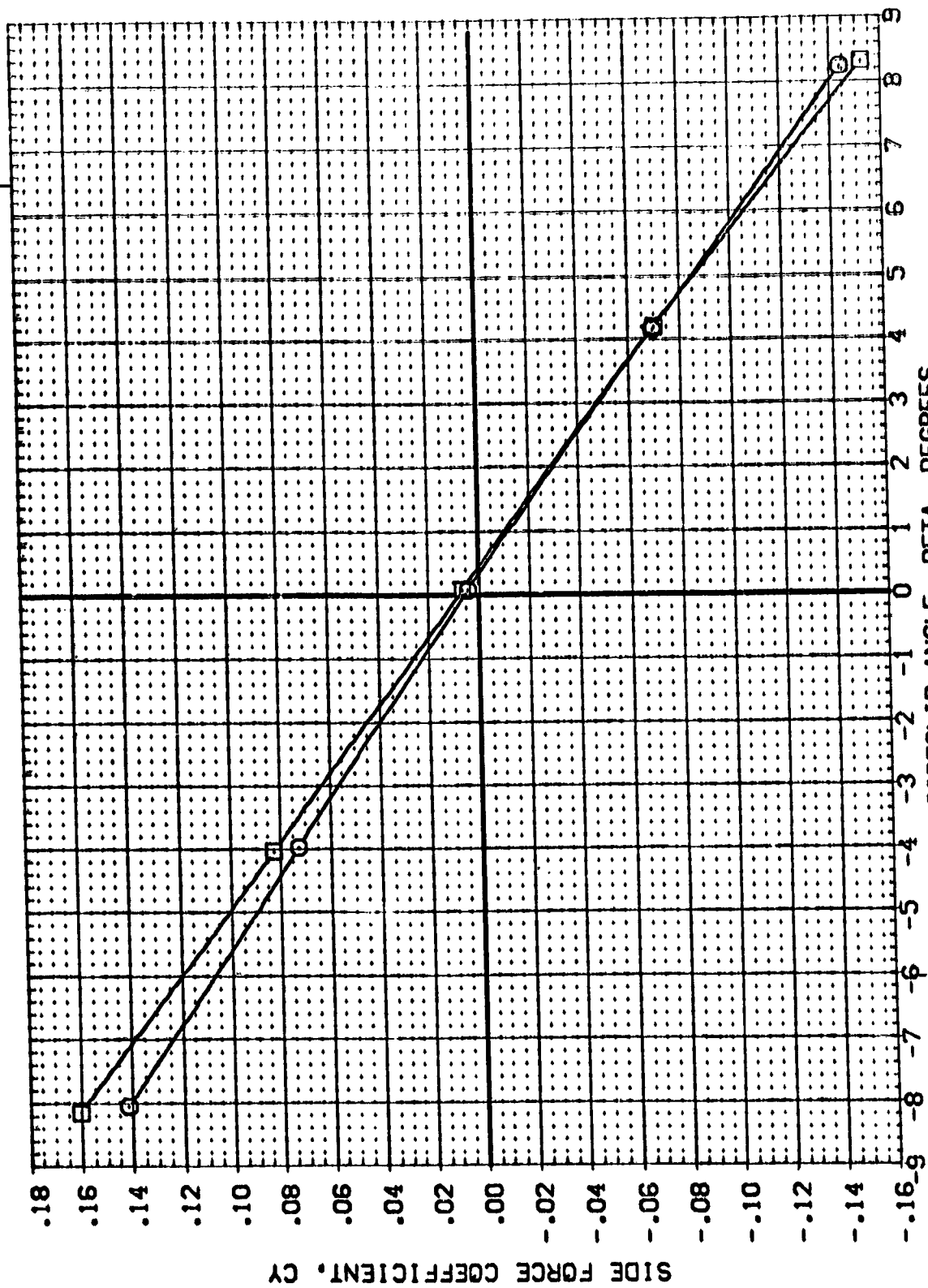
FIG.32 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.896
PAGE 260

(RBP030)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .598 .903
 □ 10.000 .000
 PARAMETRIC VALUES
 ELEVON -20.000
 RUDDER .000

REFERENCE INFORMATION
 SREF 2.4210 50.FT.
 LREF 39.8190 IN.
 BREF 39.8190 IN.
 XREF 32.3000 IN.
 YREF .0000 IN.
 ZREF .0000 IN.
 SCALE .0000



SIDESLIP ANGLE, β , DEGREES

FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.903

SECRET

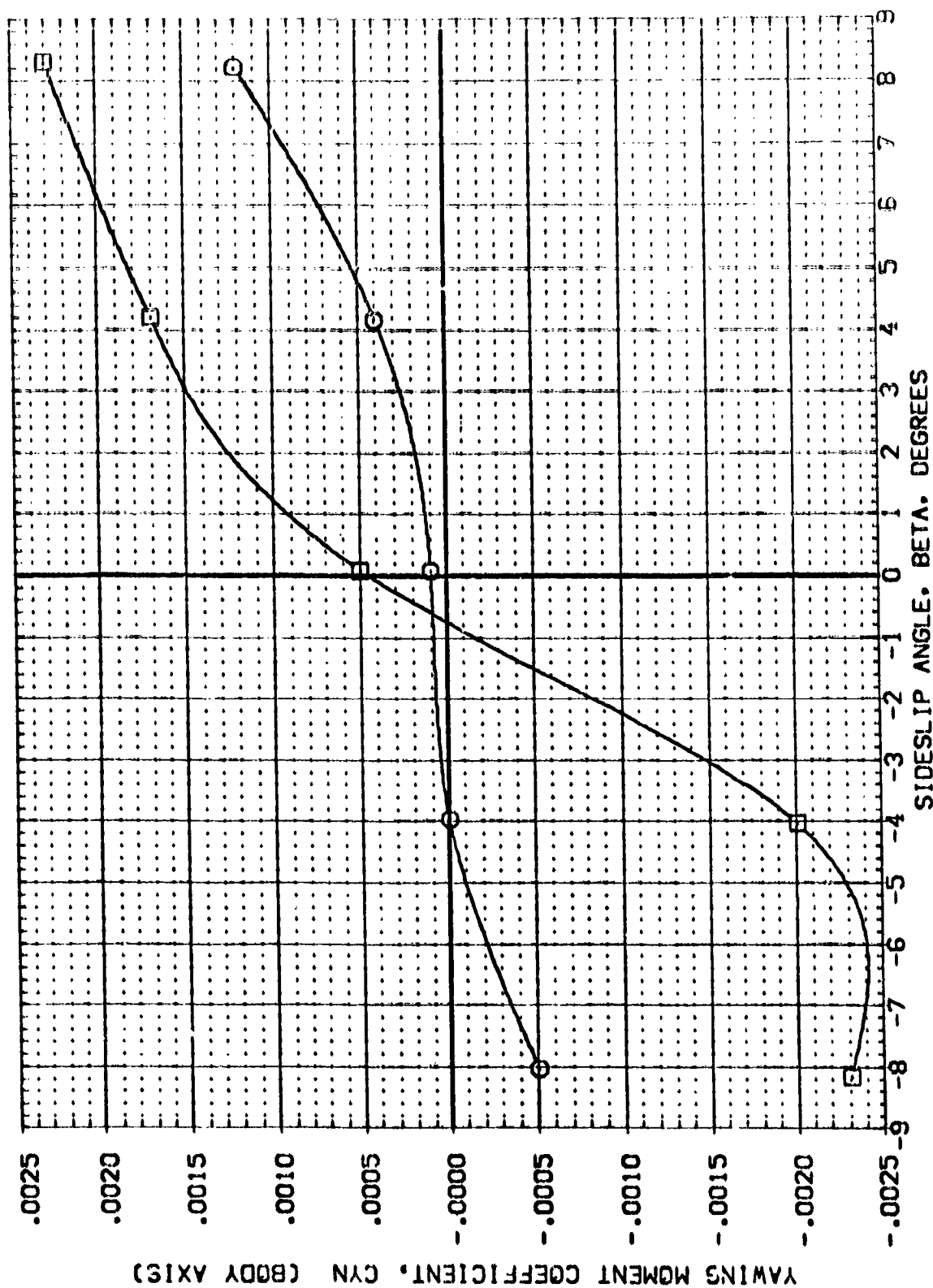


FIG. 33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., $M_1=0.598$, 0.903

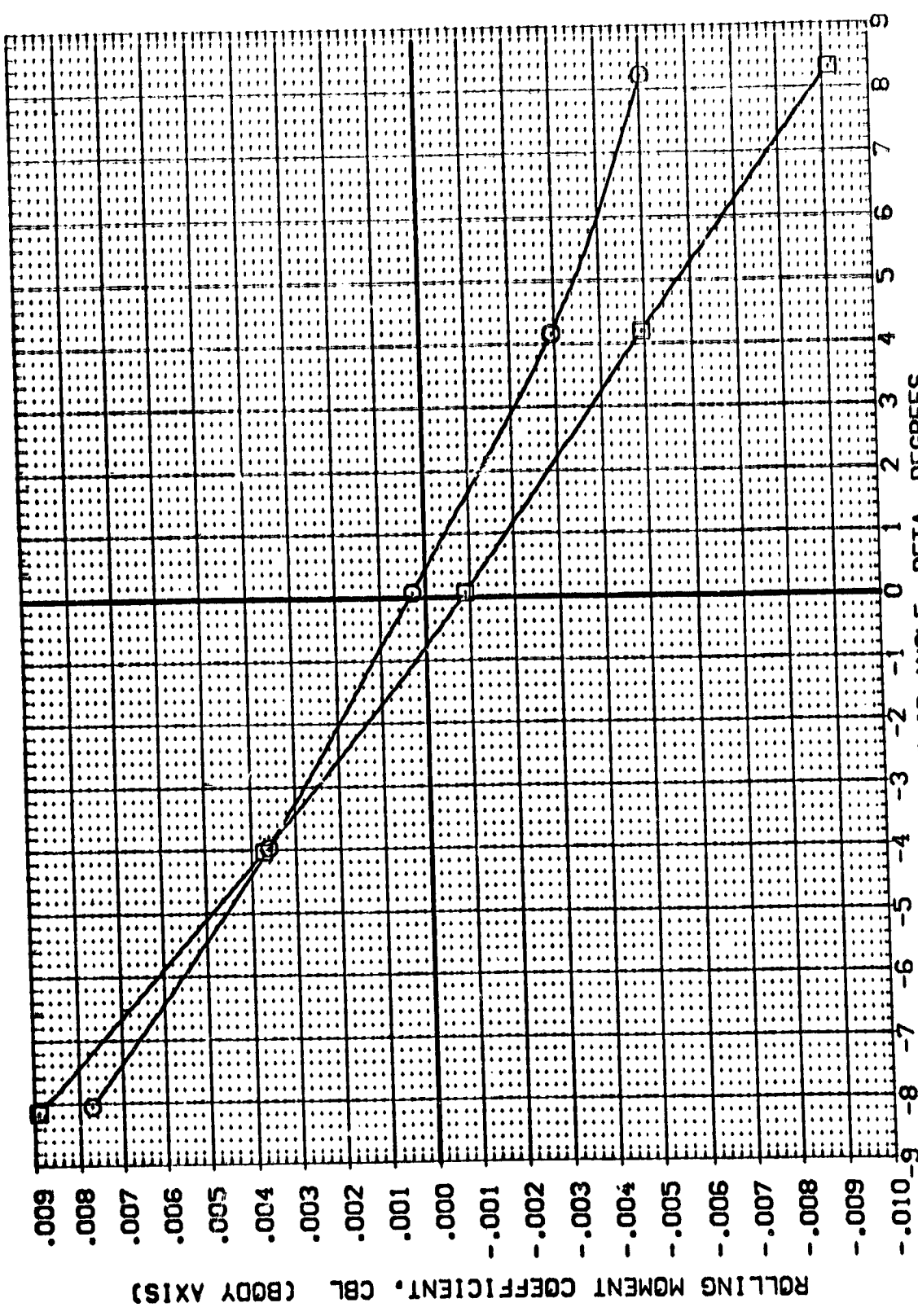


(R8P030)

AMES 11-707 GA12 C2A

SYMBOL MACH ALPHA RUDDER
 □ .598 .903
 □ .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 29.8490 IN.
 SREF 29.8490 IN.
 XREF 29.8490 IN.
 YREF 29.8490 IN.
 ZREF 29.8490 IN.
 SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.903

(RBPO30)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES			50.FT.
		ALPHA	ELEVON	RUDFLR	
□	.598	10.000	-20.000		
○	.903	.000	.000		

REFERENCE INFORMATION

SREF	2.4210
LREF	39.8490
BREF	39.8490
YMRP	32.3000
ZMRP	.0000
SCALE	.0300

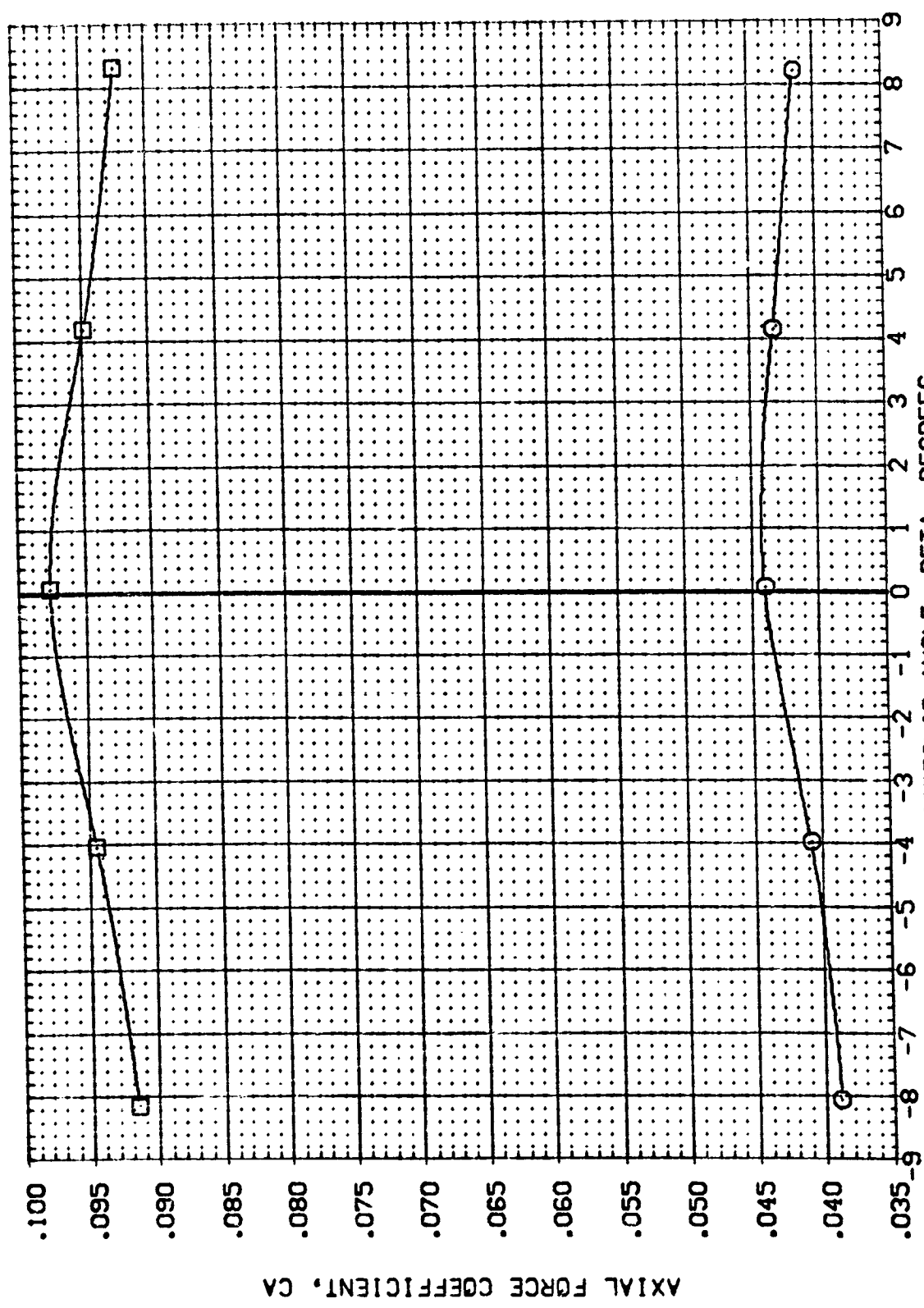


FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598,0.903

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(RBPO30)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .598 .903
□ .000 .000

PARAMETRIC VALUES
10.000 ELEVON -20.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

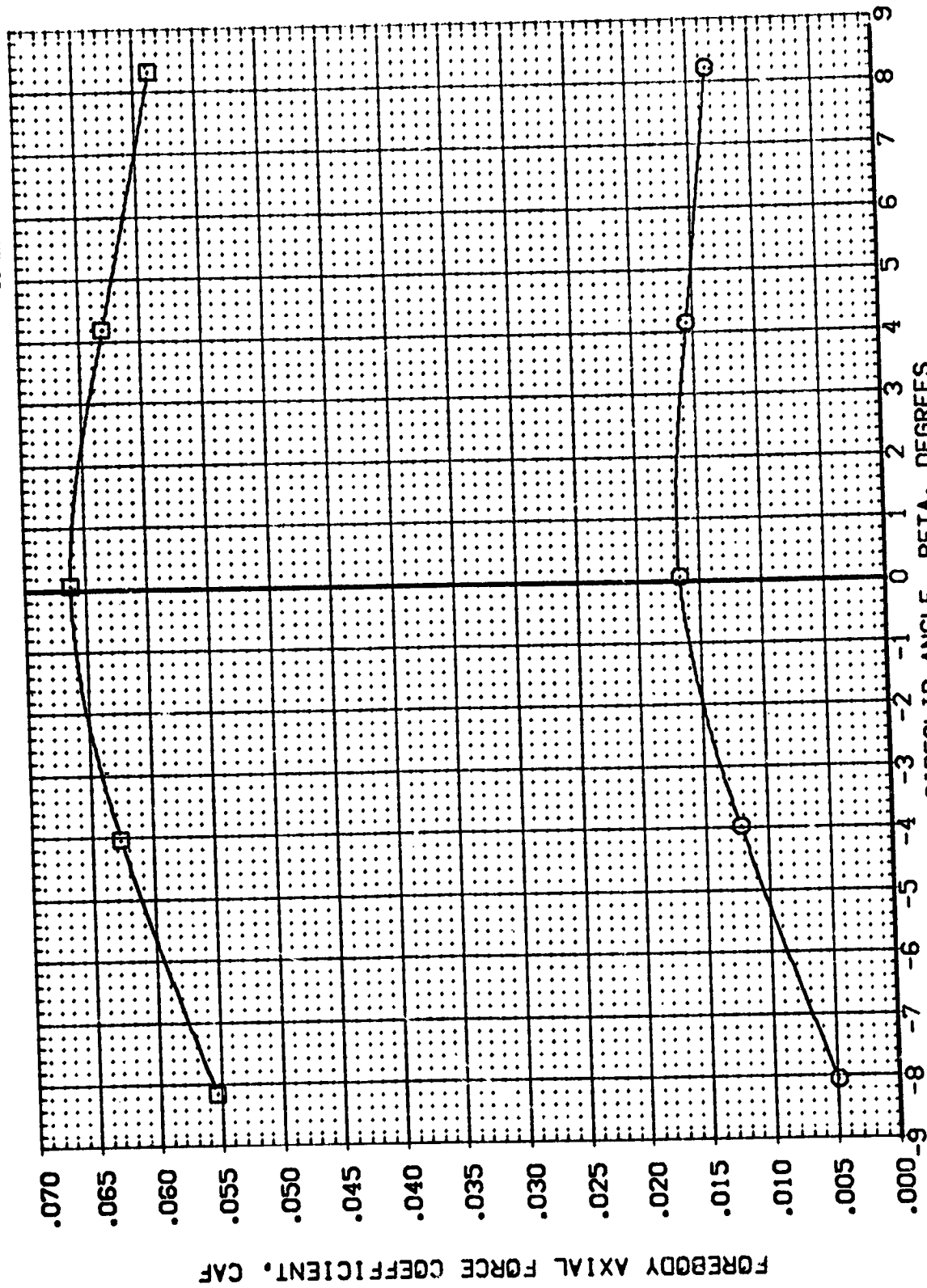


FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598,0.903
PAGE 265

(RBP030)

AMES 11-707 0A12 02A

SYMBOL
□

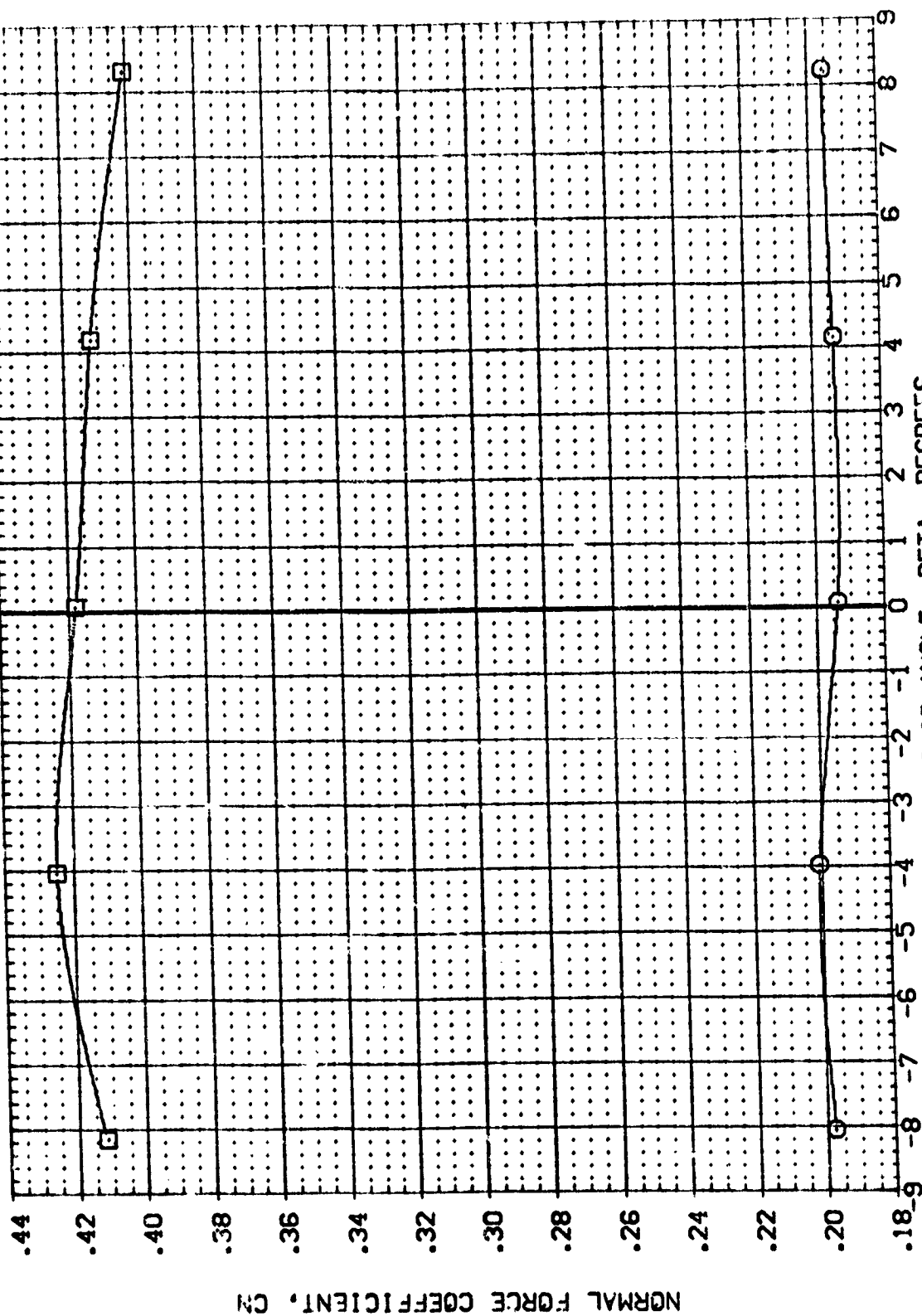
MACH
.598
.903

ALPHA
RUDDER

PARAMETRIC VALUES

10.000 ELEVON -20.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598,0.903

AMES 11-707 0A12 02A

(RBP030)

REFERENCE INFORMATION		SG.FT.
SREF	2.4210	IN.
LREF	39.8450	IN.
BREF	39.8450	IN.
XREF	32.3000	IN.
YREF	0.0000	IN.
ZREF	0.0000	IN.
SCALE	0.0000	SCALE

SYMBOL	MACH	PARAMETRIC VALUES
<input type="radio"/>	.598	ALPHA
<input type="radio"/>	.903	RUDDER
		10.000 ELEVON
		.000 RUDDFLR
		-20.000
		.000

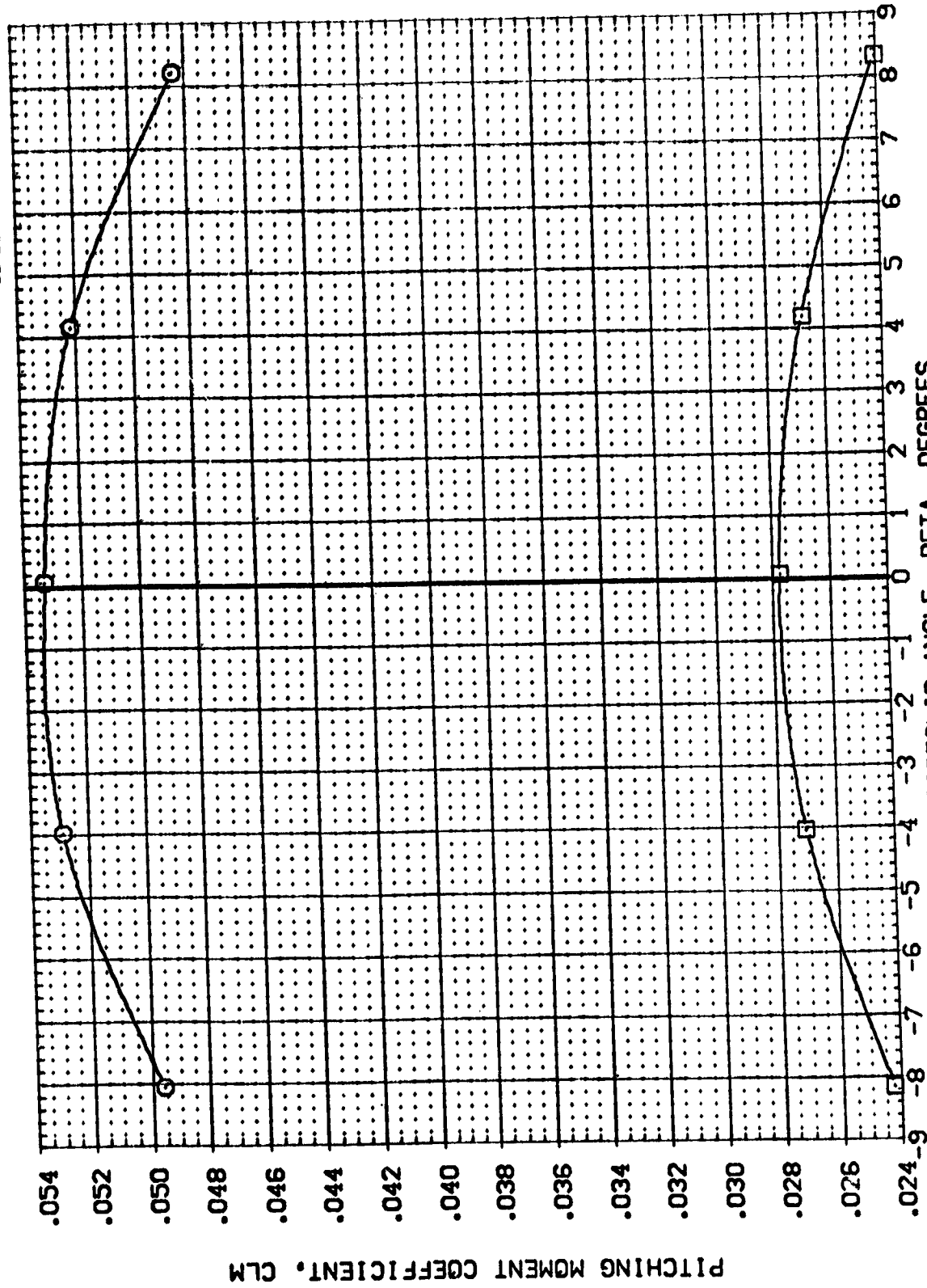


FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598,0.903

(RBP03C)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
○ .598 .000
□ .903 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8490
BREF 38.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

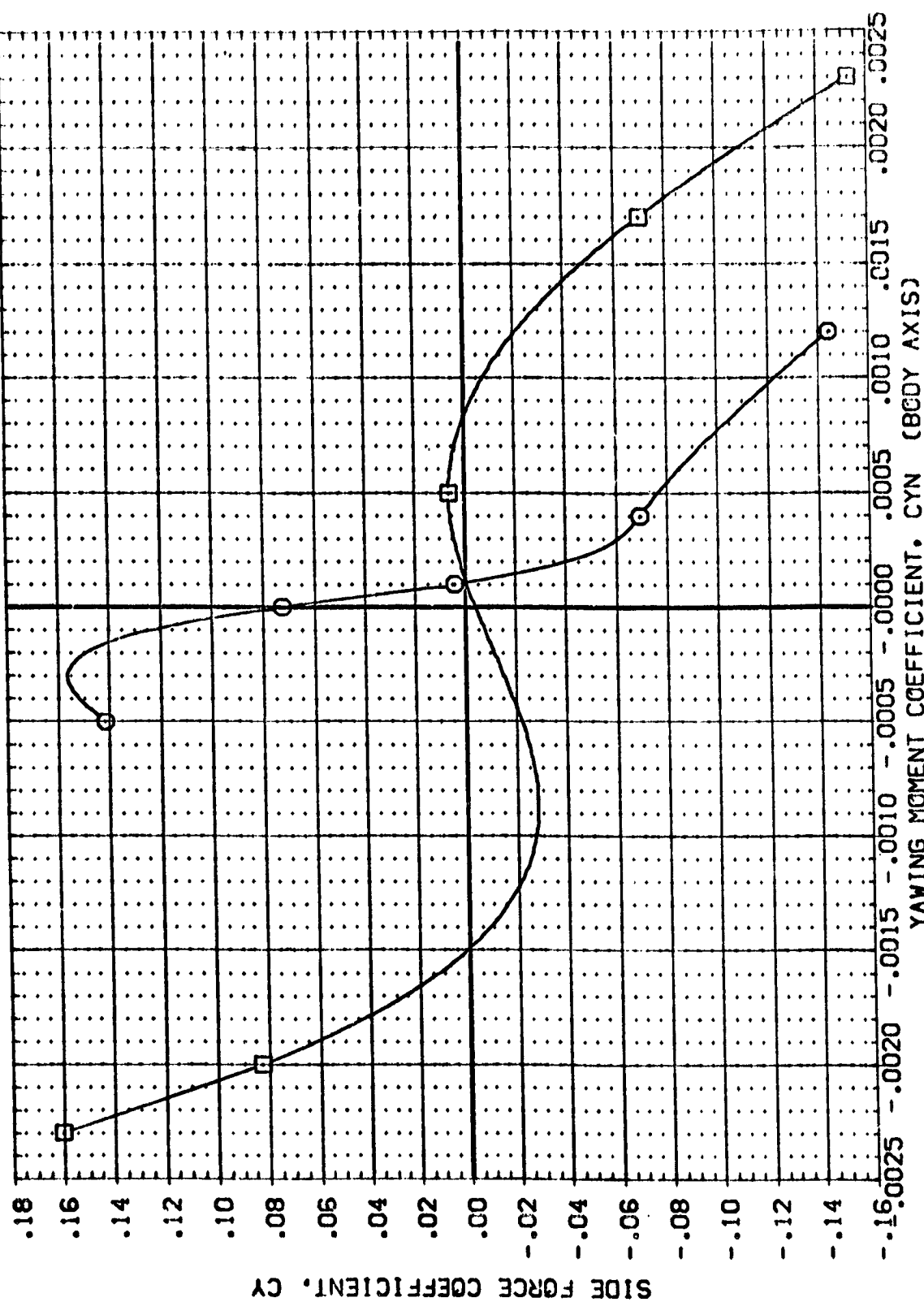


FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598, 0.903



[ABP030]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .598 .000 .000
□ .903 .000 .000

PARAMETRIC VALUES
10.000 ELEVON -20.000

REFERENCE INFORMATION
SREF 2.42:0
LREF 38.8450
BREF 32.8450
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.33 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., ELEVON=-20 DEGS., MN=0.598,0.903

(RBP031)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .000 .000
□ .998 .000 .000

PARAMETRIC VALUES
15.000 ELEVON -20.000
.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

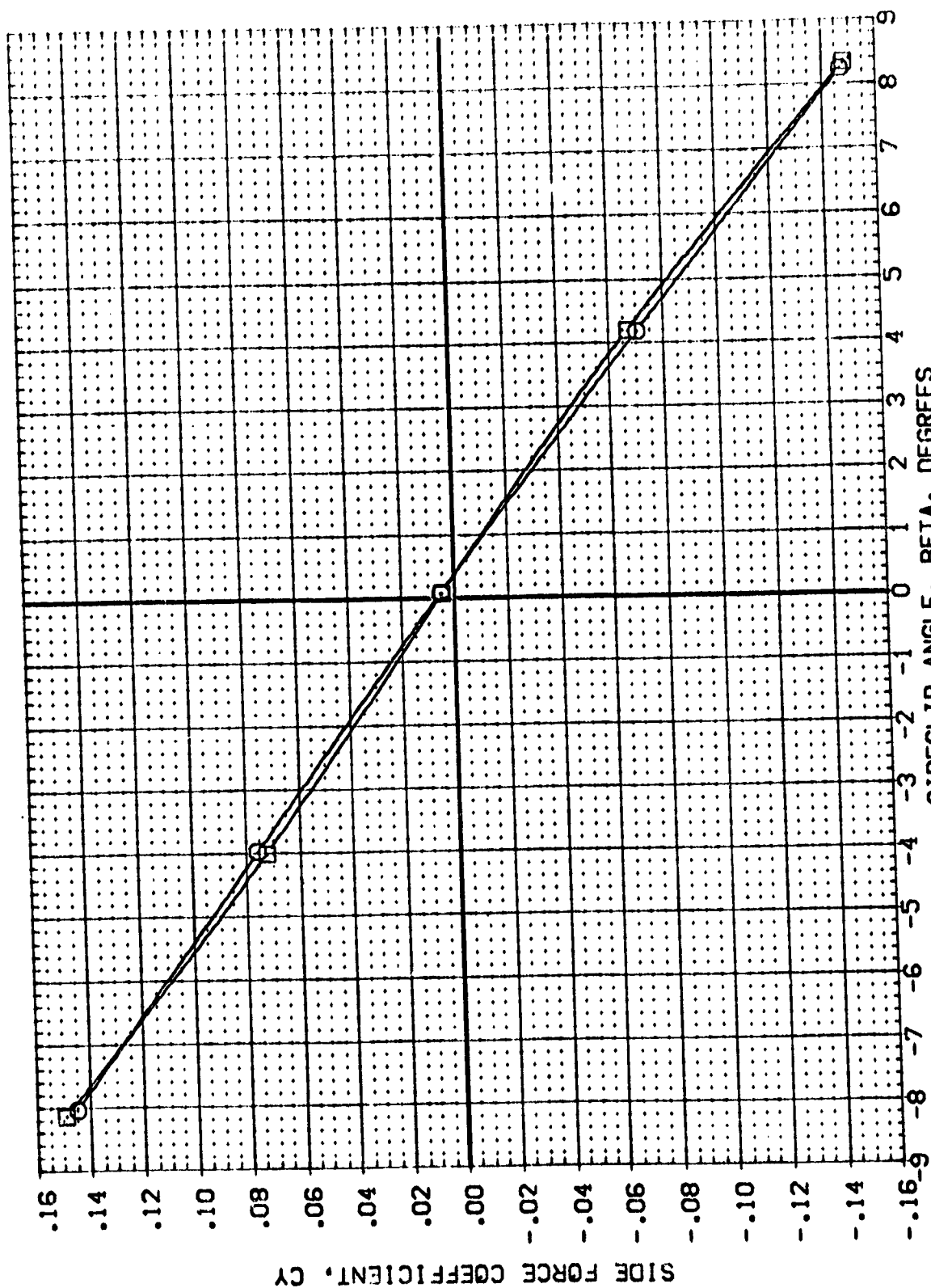


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898



[RBP031]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .898
□ .000 .000

PARAMETRIC VALUES
15.000 ELEVON -20.000
.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0001

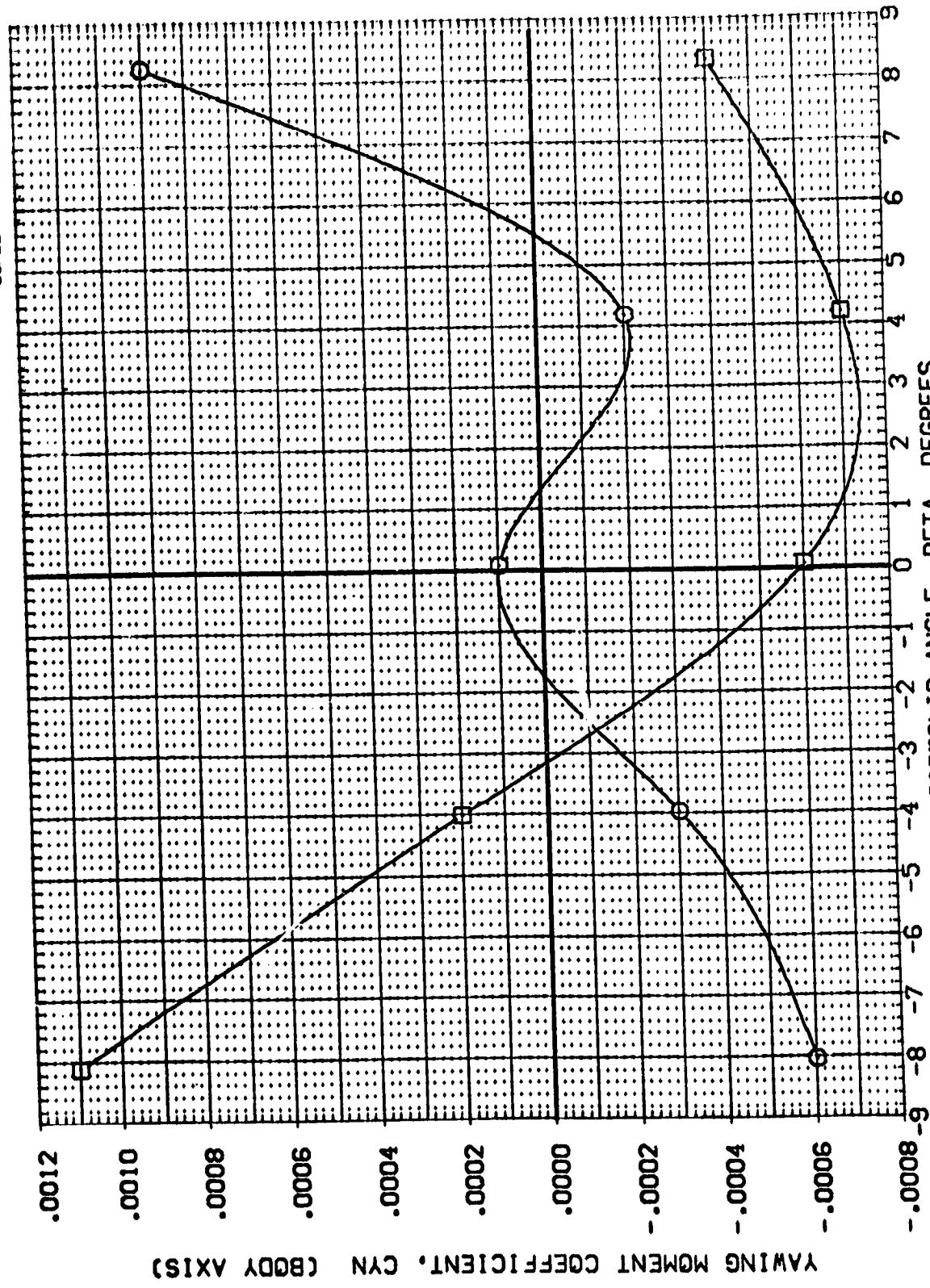


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898

(RBP031)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
□ □ .500 .898 15.000 .000 -20.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

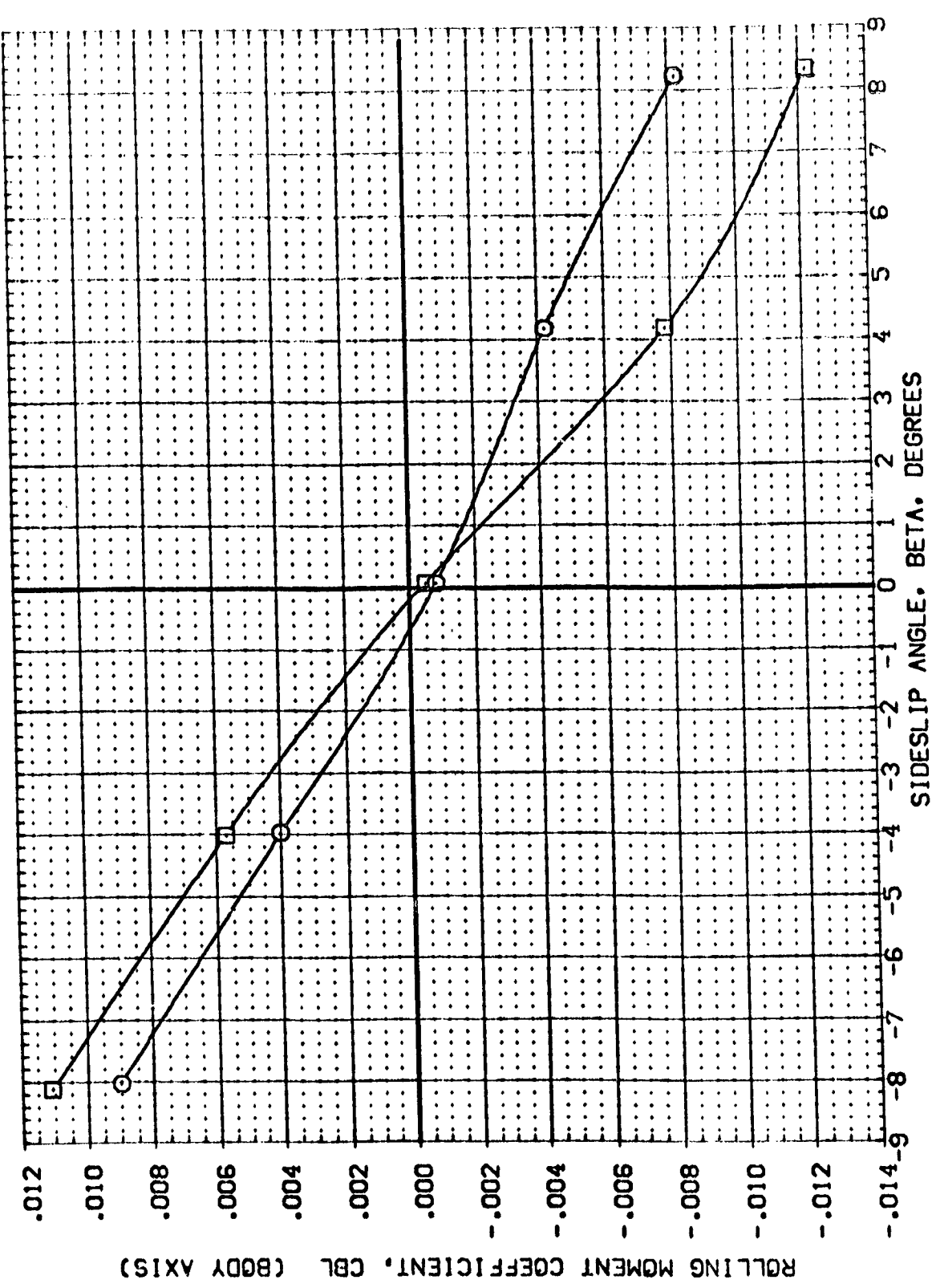


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898

11

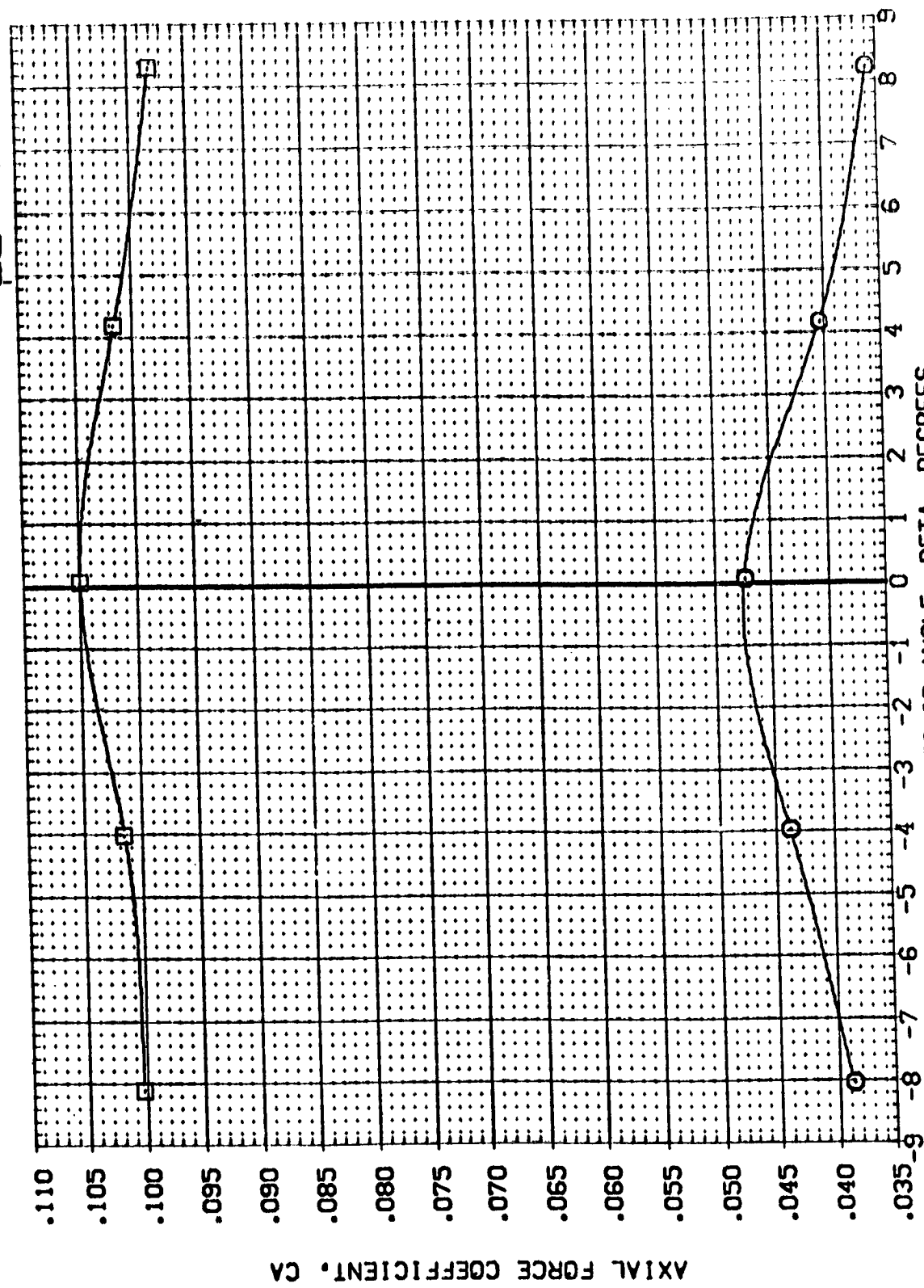
AMES 11-707 0A12 02A

(RBPO3!)

SYMBOL MACH ALPHA RUDDER
 O .600 .000
 □ .898 .000

PARAMETRIC VALUES
 15.000 ELEVON -20.000
 .000 RUDELR .000

REFERENCE INFORMATION
 SHEET 2.4210
 LREF 39.6450
 EREF 39.6450
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., YN=0.600, 0.898

(982031)

SYMBOL	MACH	ALPHA	ELEVATION	PARAMETRIC VALUES
<input type="radio"/>	.600		15.000	-20.000
<input type="checkbox"/>	.898	RUDDER	.000	RUDDER

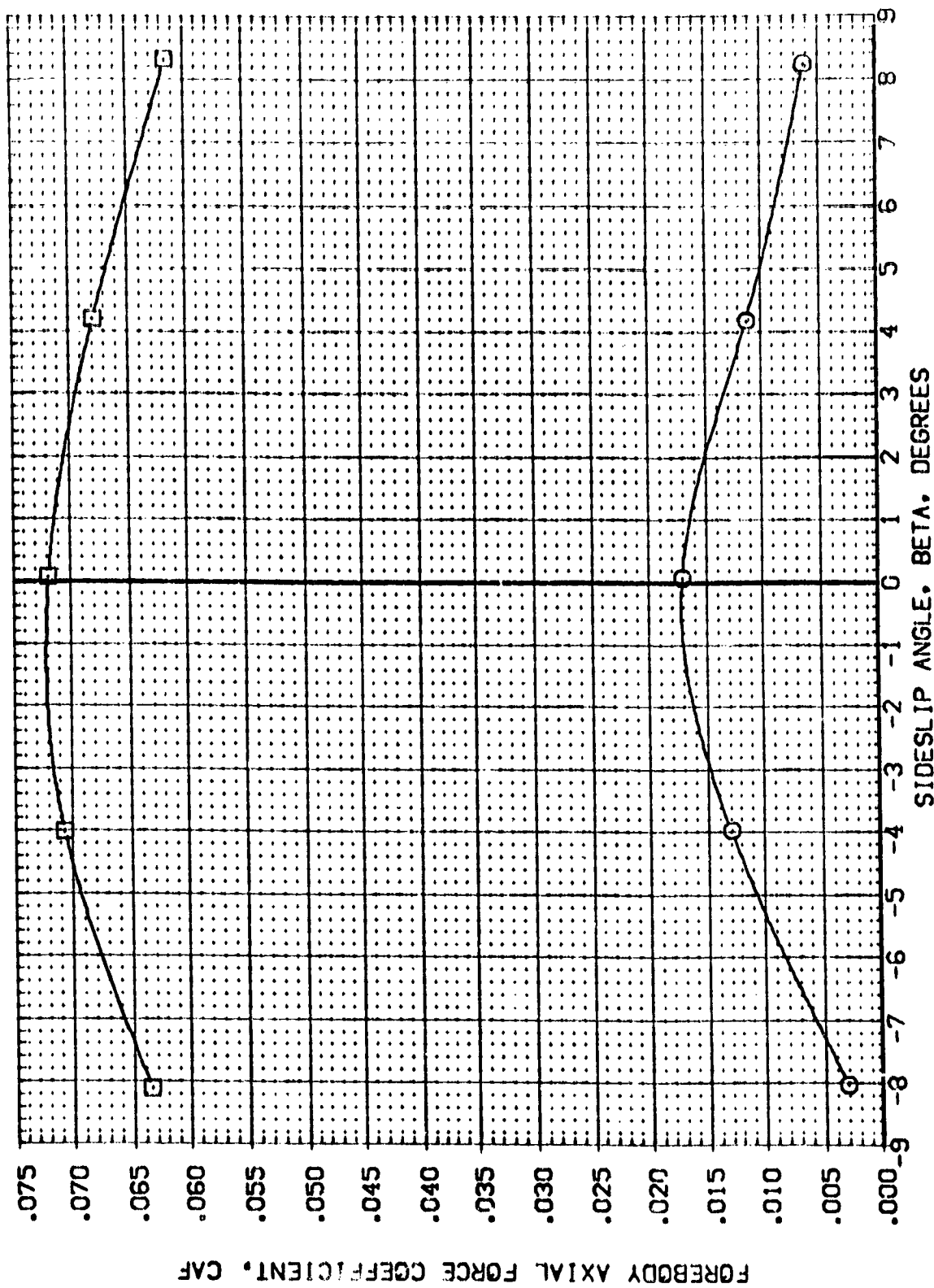
[illegible]

FIG. 34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898

(RBP031)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON R/OFLR
 O .600 .000 .000 -20.000
 □ .898 .000 .000 .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8160 IN.
 BREF 39.8160 IN.
 XREF 32.3000 IN.
 YREF 0.0000 IN.
 ZREF 0.0000 IN.
 SCALE .0000

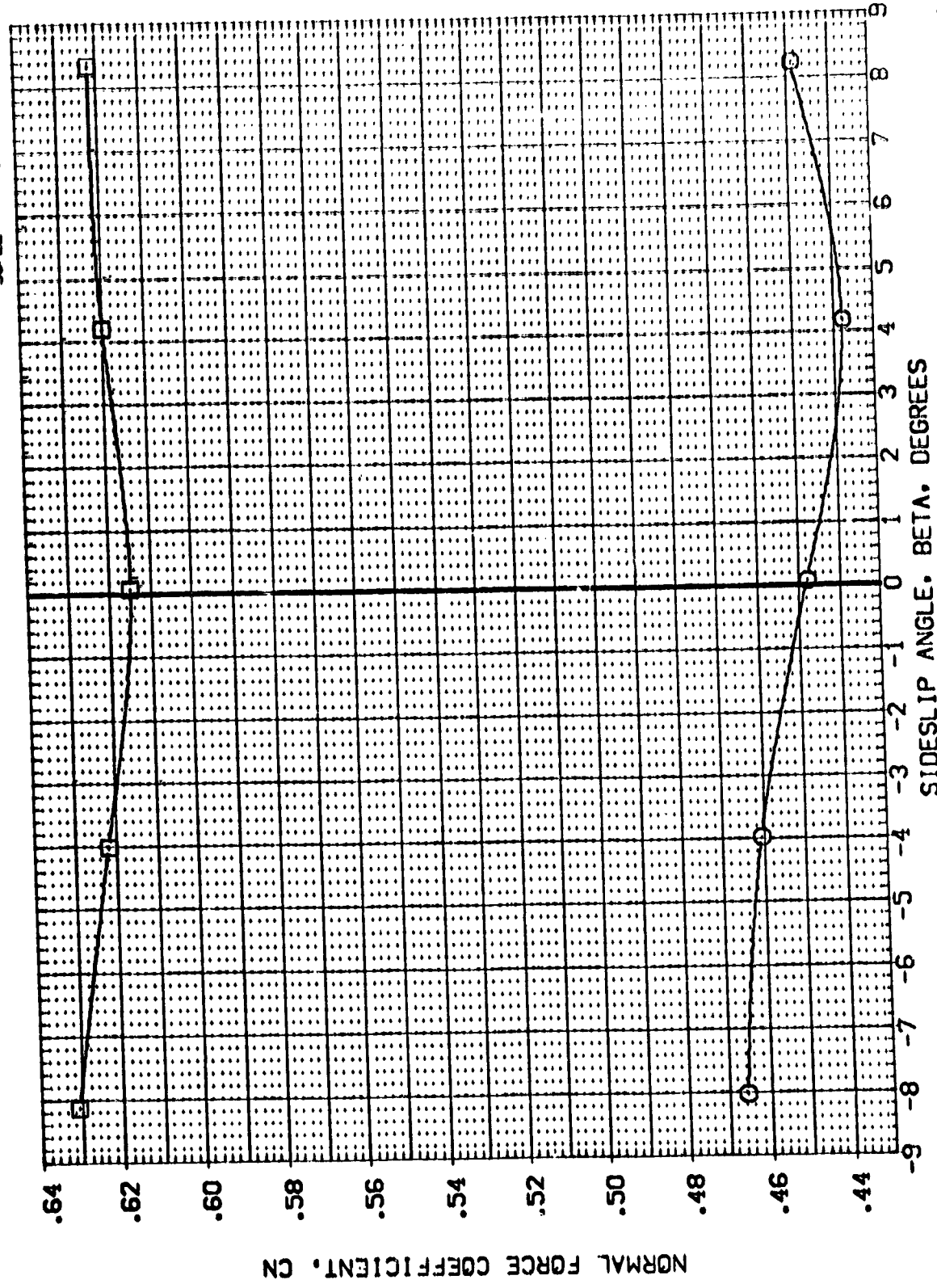


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., YN=0.600, Z.898



(R9P031)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SHEET 2-4510
DATE 28-8-80
BY 28-8-80
XREF 28-8-80
PAGE 28
SCALE 1:1000

SYMBOL MACH ALPHA ELEVON RUDDER
□ .600 .898
□ .000 .000
□ .000 .000

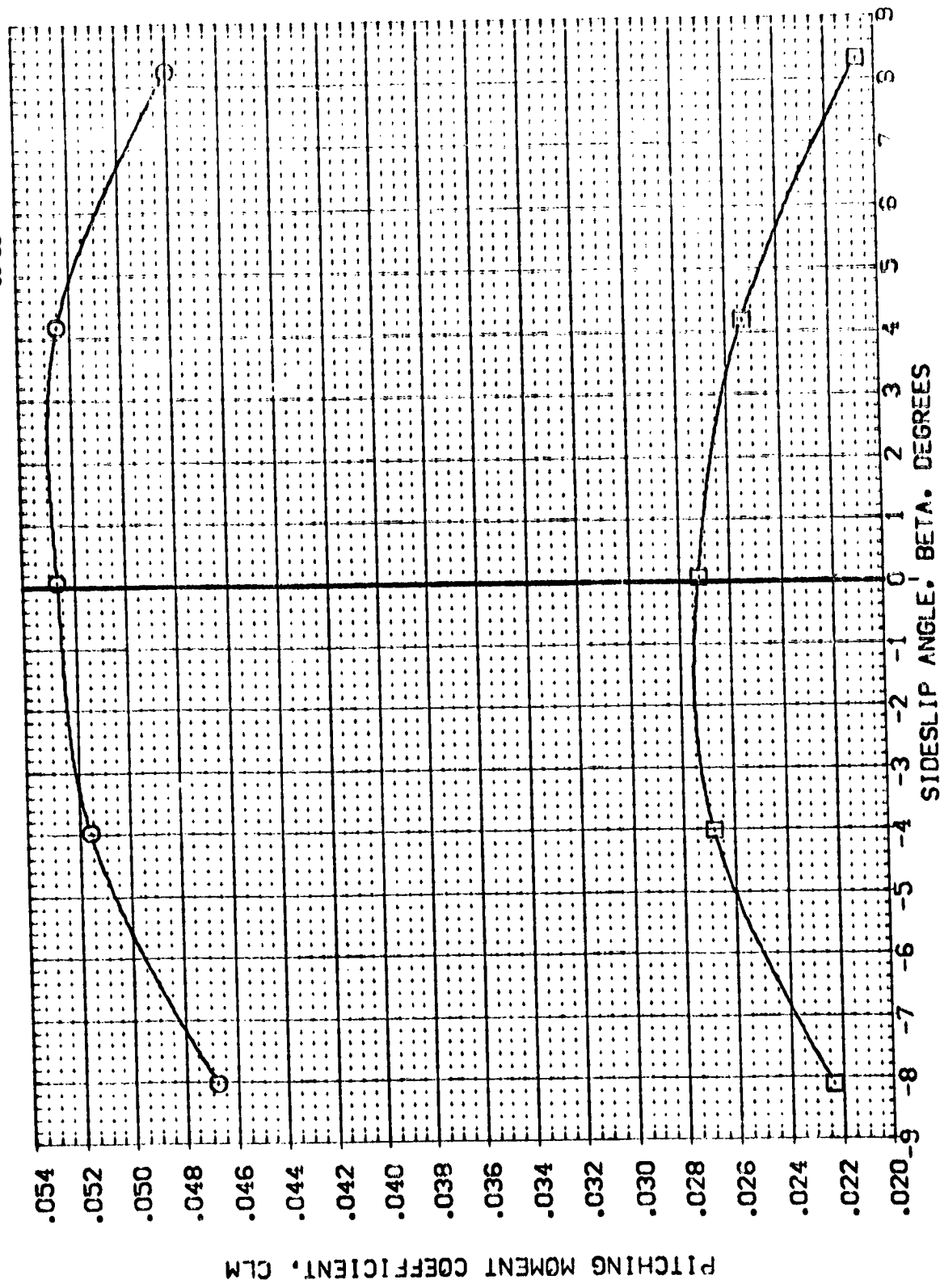


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898
PAGE 275

(RBP031)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
O .600 .898
□ .000 .000

REFERENCE INFORMATION
SPEC 2.5211
UNIT 30.8550
BASE 30.8550
X-REF 30.8550
Y-REF 30.8550
Z-REF 30.8550
SCALE 1:100

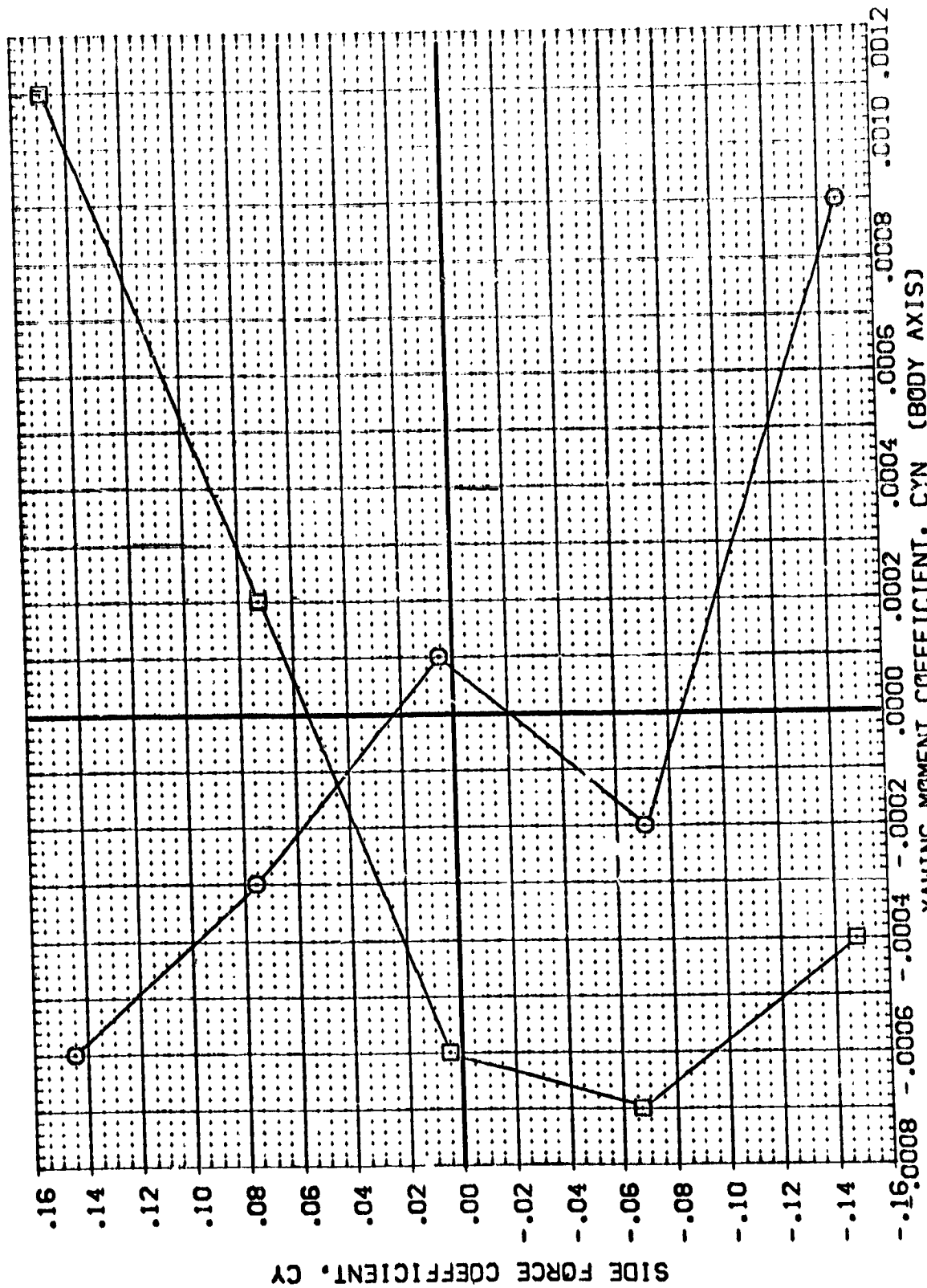


FIG.34 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898



(ABP031)

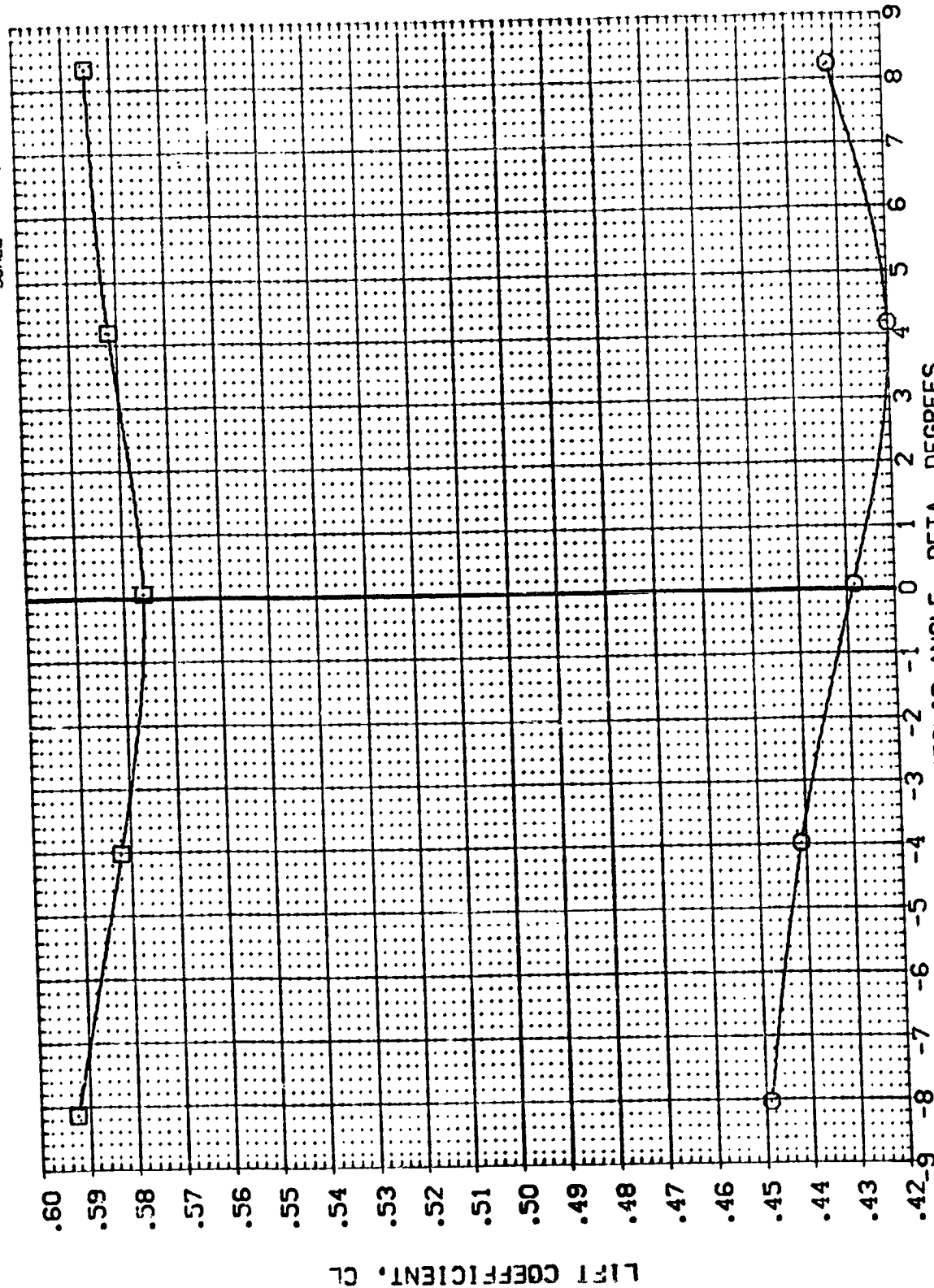
AMES 11-707 0A12 02A

SYMBOL
□

MACH .600
.898

PARAMETRIC VALUES
ALPHA 15.000
ELEVON -20.000
RUDDER .000
RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.9490
BREF 38.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

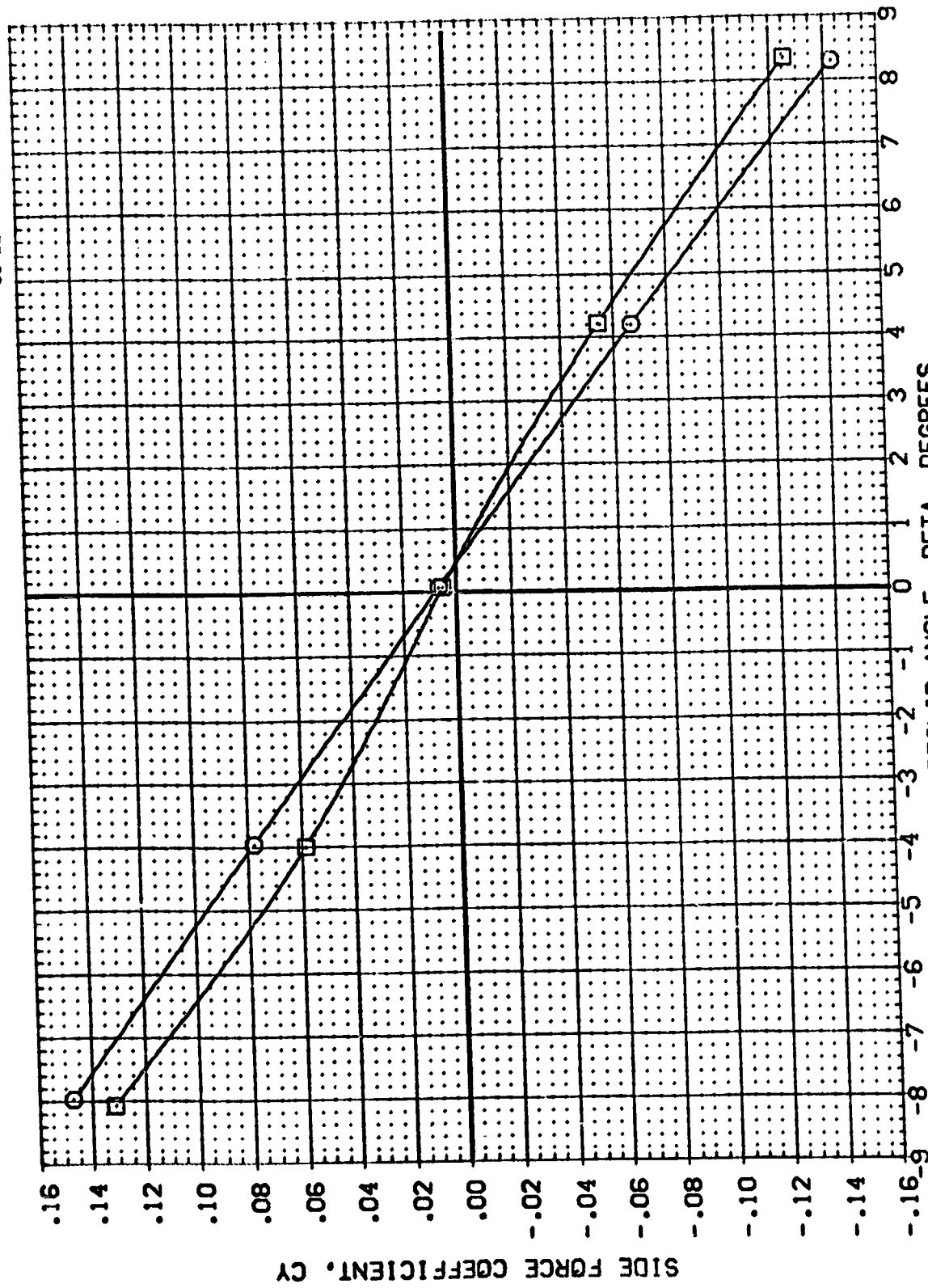
FIG.34 ORBITER LAT-OIR. DATA AT ALPHA=15 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.898

(RBP032)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .600 .902
□ 20.000 .000
ELEVON -20.000 .000
RUDFLR

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600,0.902



AMES 11-707 0A12 02A

(RBP032)

SYMBOL MACH ALPHA CLUDER PARAMETRIC VALUES
□ .600 .902 20.000 .000 ELEVON RUDEL R .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8480
BREF 38.8480
XREF 32.5000
YREF 0.0000
ZREF 0.0000
SCALE .0300

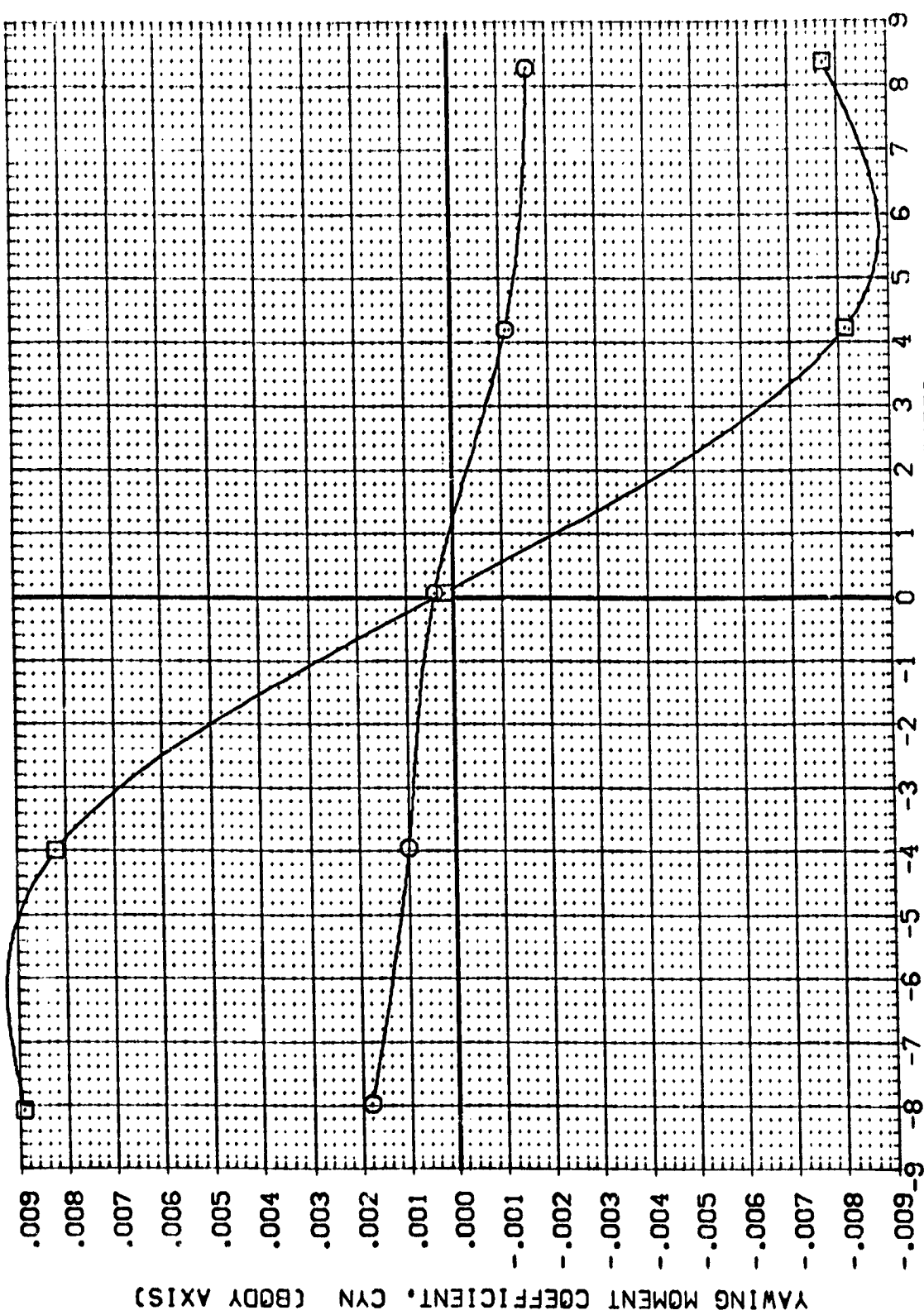


FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.902
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(RBP032)

AMES 11-707 0A12 02A

SYMBOL	MACH	PARAMETRIC VALUES		
		ALPHA	ELEVON	RUFLR
□	.600	20.000	-20.000	.000
○	.502	.000	.000	.000

REFERENCE INFORMATION:
SREF 2.4210 SQ.FT.
LREF 38.8490 IN.
BREF 38.8490 IN.
XREF 32.3000 IN.
YREF 0.0000 IN.
ZREF 0.0000 IN.
SCALE .0300

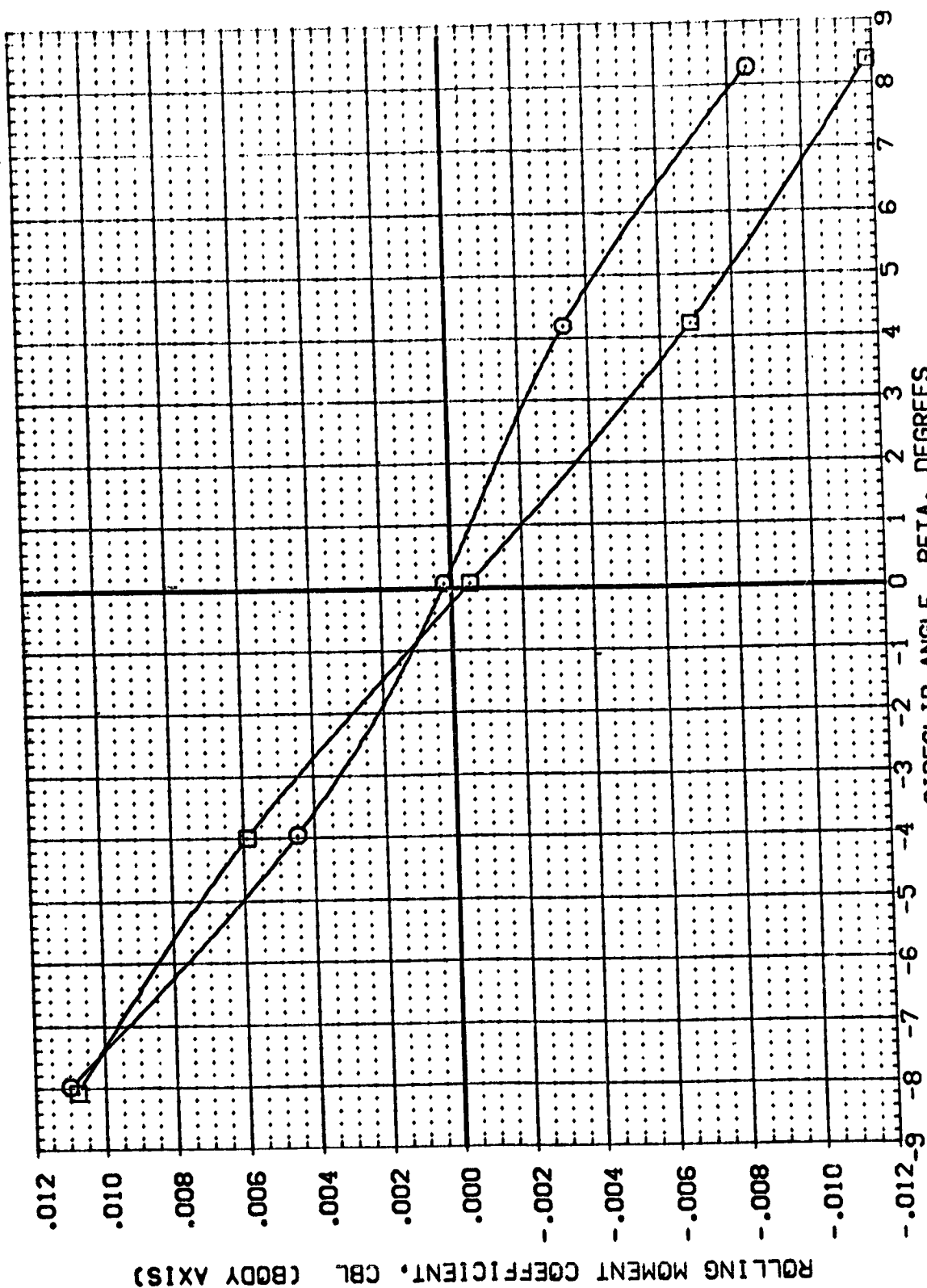


FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600,0.902



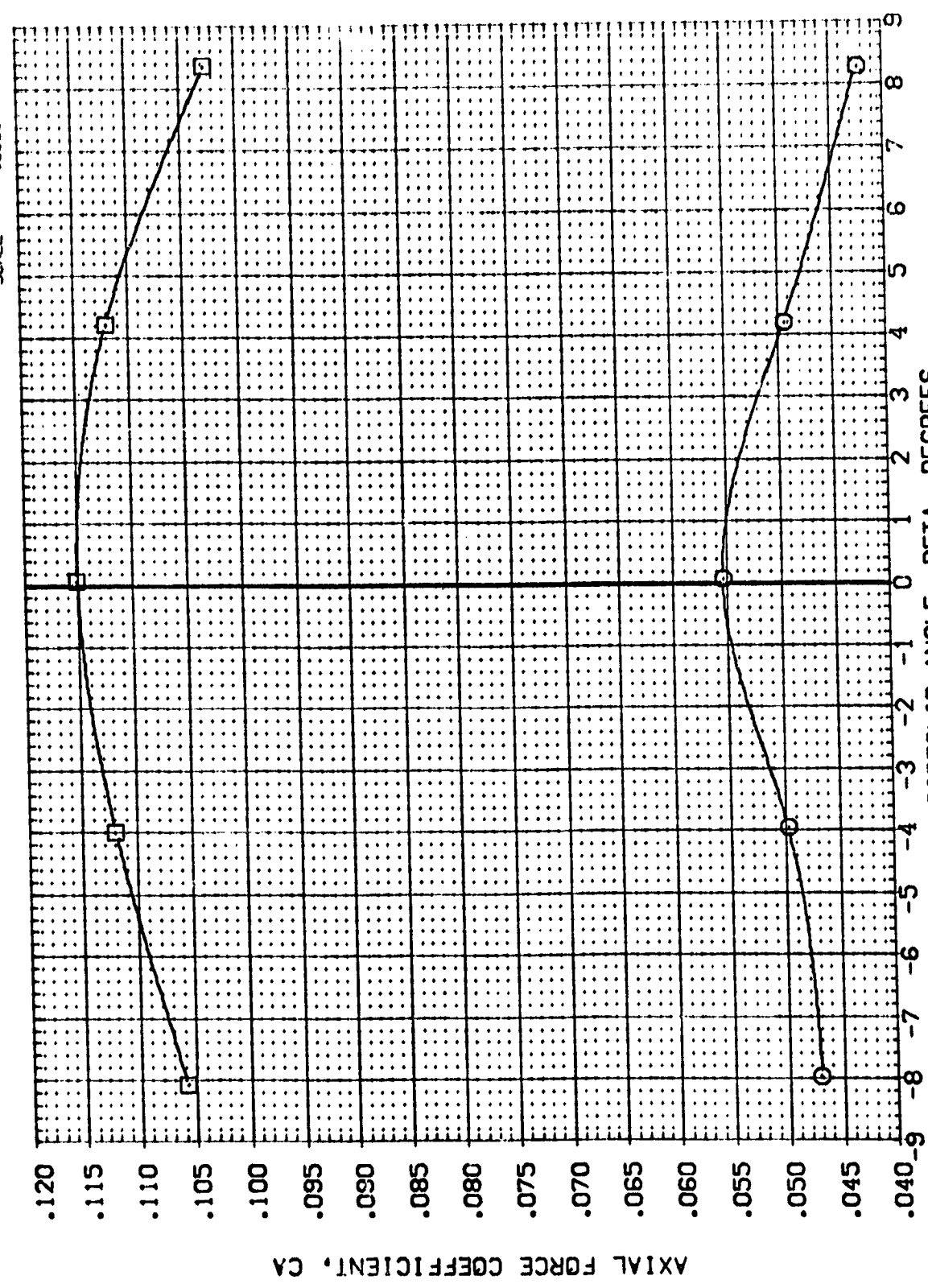
(RBP032)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8480
BREF 35.8450
XMRP 32.3000
YMRP 0.0000
ZMRP 0.0000
SCALE 1.0000

PARAMETRIC VALUES
MACH .600
ALPHA 20.000
ELEVON -20.000
RUDDER .000
RUOFLR .000

SYMBOL
○
□



SIDESLIP ANGLE, BETA, DEGREES

FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.902



[RBP032]

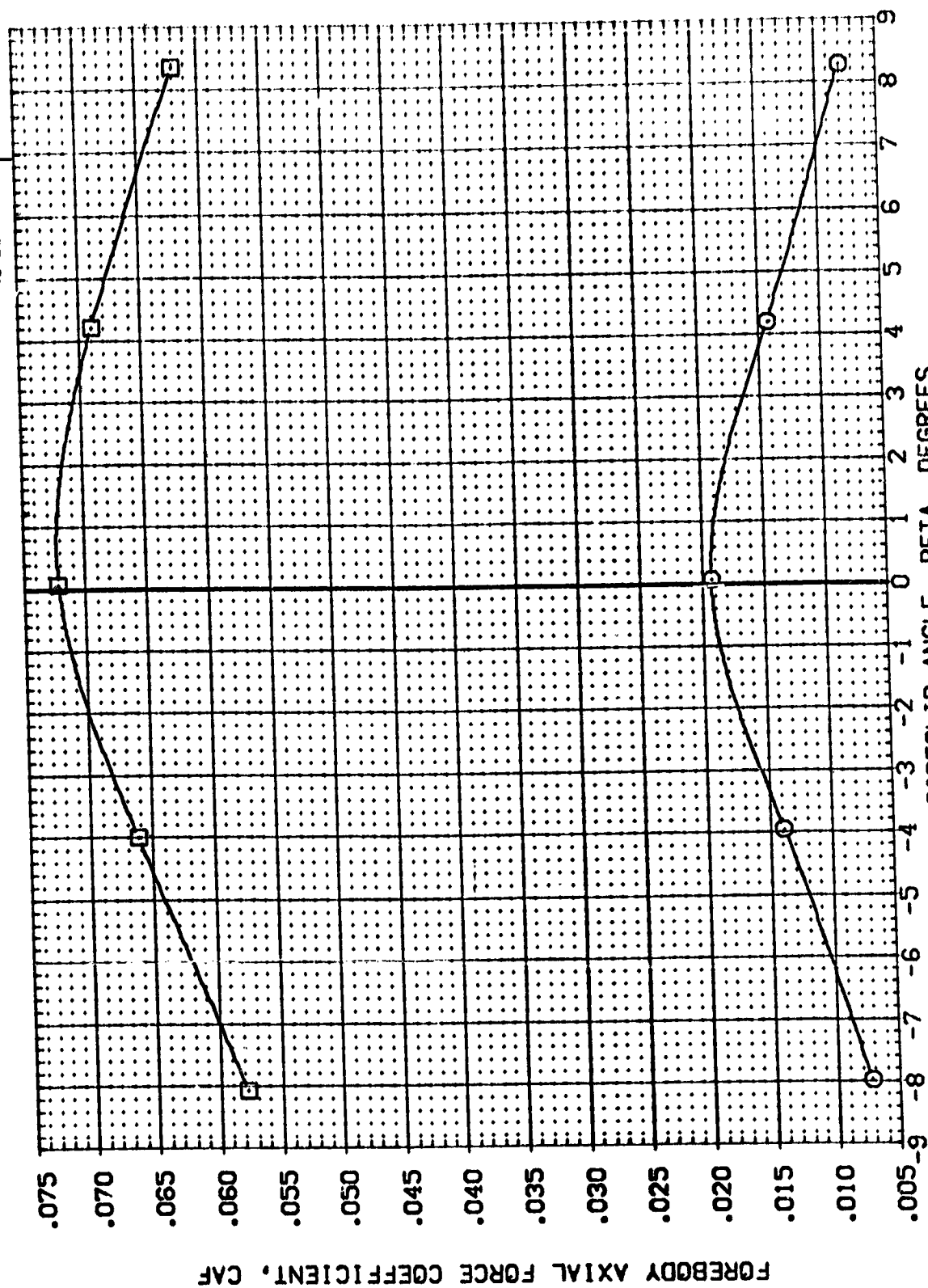
AMES 11-707 0A12 02A

SYMBOL
□
○

MACH
.600
.902

PARAMETRIC VALUES
20.000 ALPHA
.000 ELEVON
.000 RUDDER

REFERENCE INFORMATION
SREF 2.4210
LREF 29.8450
BREF 29.8450
XREF 32.3000
YREF 0.0000
ZREF 0.0000
SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600,0.902

AMES 11-707 GA12

SYMBOL

MACH	ALPHA	RUDDER
.600		
.902		

PARAMETRIC VALUES	
:20,000	ELEVON
.000	RJOFLR
	-20,000
	.000

REFERENCE INFORMATION	
SREF	2 4210
LREF	39.8°50
BREF	39.8°50
XREF	32.5000
YREF	0.0000
ZREF	0.0000
SCALE	0.0000

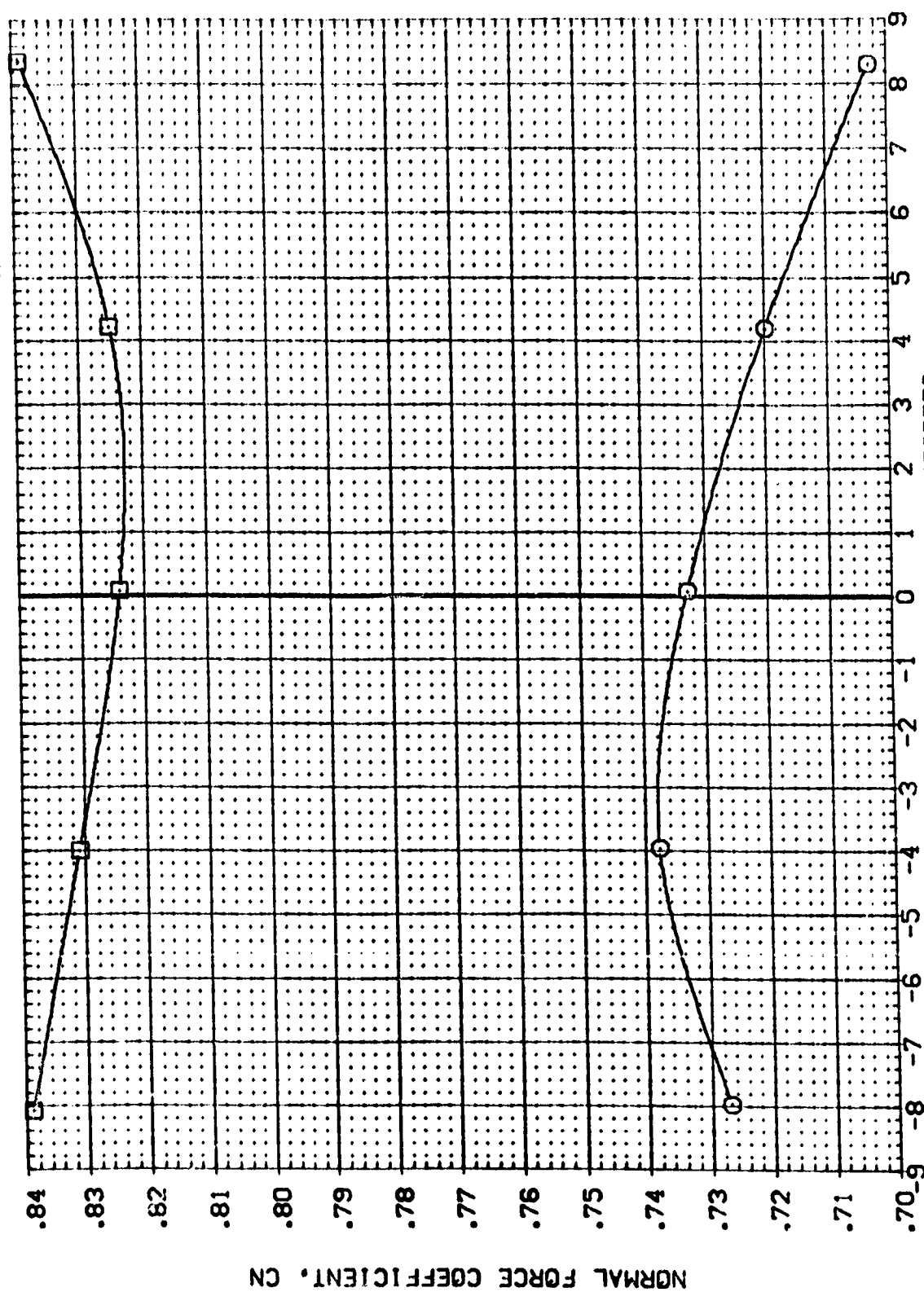


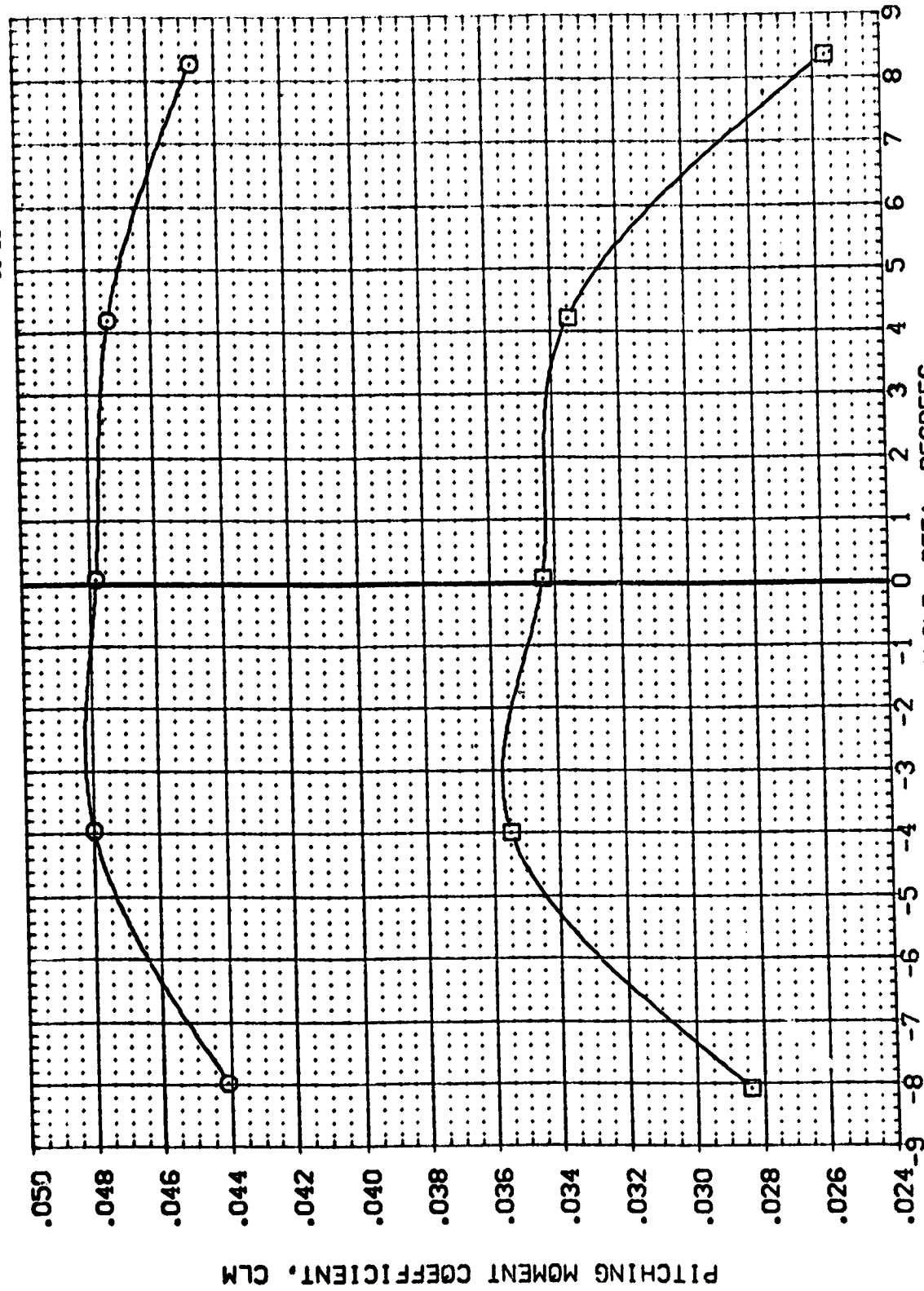
FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.902

AMES 11-707 0A12 02A

(RBP032)

SYMBOL	MACH	ALPHA	RUDDER	PAR-METRIC VALUES	20.00	ELEVON	-20.000
<input type="checkbox"/>	.600	.902		.000	RUOFLR	.000	

REFERENCE INFORMATION	
SREF	2.4210
LREF	38.8450
BREF	38.8450
XGRP	32.3060
YGRP	.0000
ZGRP	.0000
SCALE	.0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.902

(RBPC32)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .902
□ .600 .902

PARAMETRIC VALUES
20.000 ELEVON -20.000
.000 RUDDER .000

REFERENCE INFORMATION
SREF 2.421C
LREF 35.849C
BREF 35.849C
XMRP 32.300C
YMRP .000C
ZMRP .000C
SCALE .030C

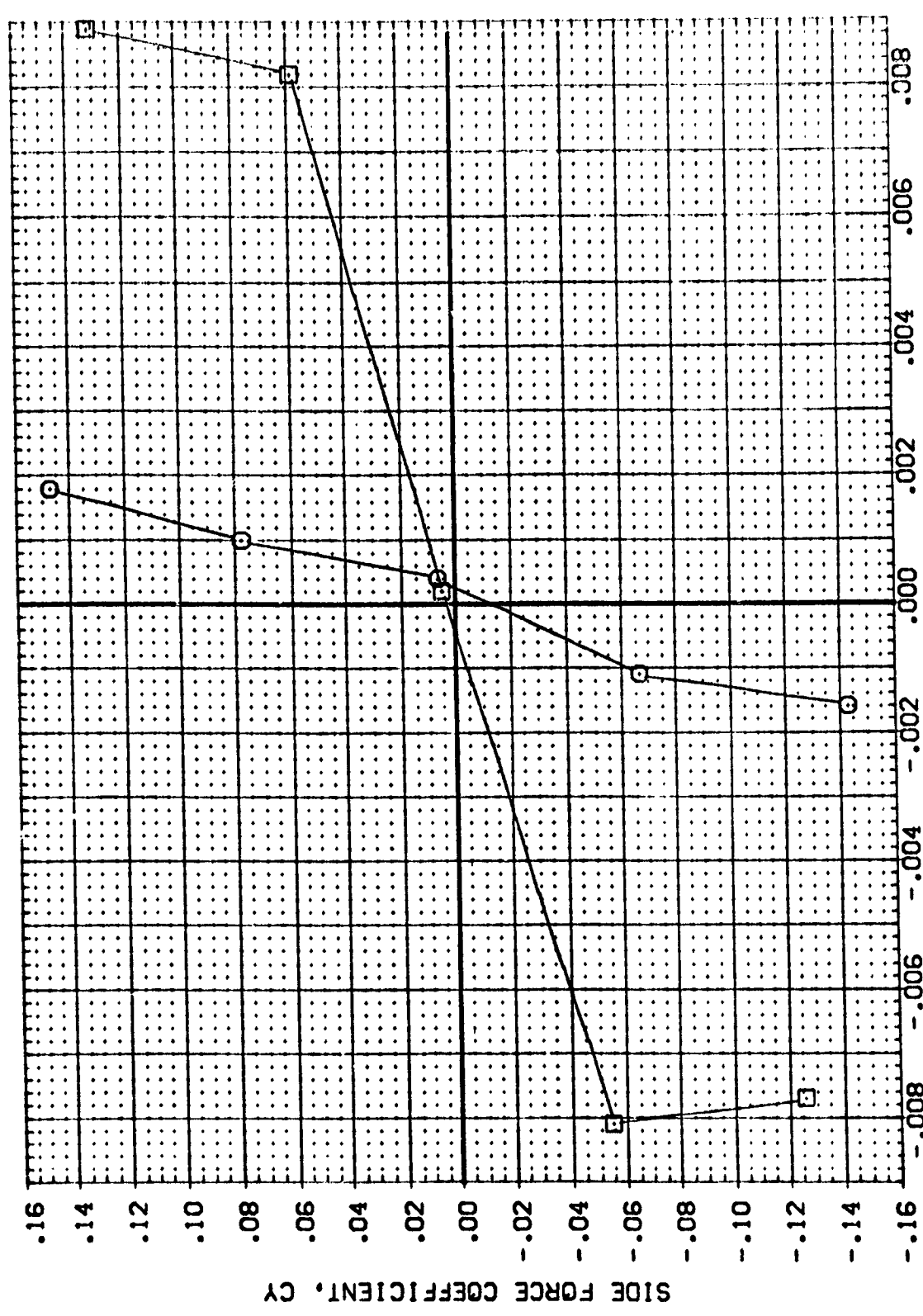


FIG.35 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600,0.902
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(ABP032)

AMES 11-707 OA12 02A

SYMBOL MACH ALPHA RUDDER
□ .600 .000 .000
□ .902 .000 .000

PARAMETRIC VALUES
20.000 ELEVON
.000 RUOFLR

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
WREF 32.5000 IN.
WARP .0000 IN.
WARP .0000 IN.
SCALE .0300

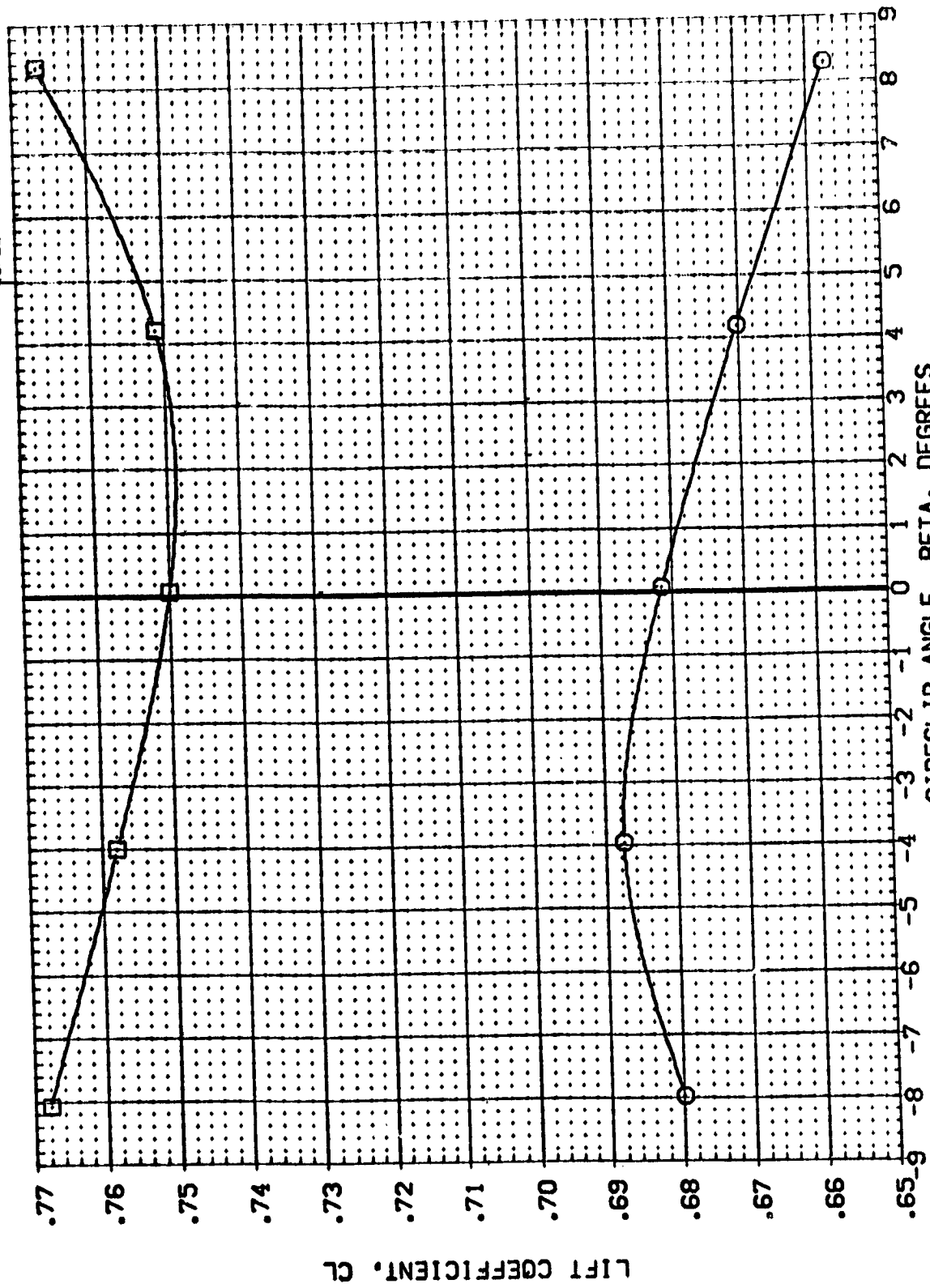


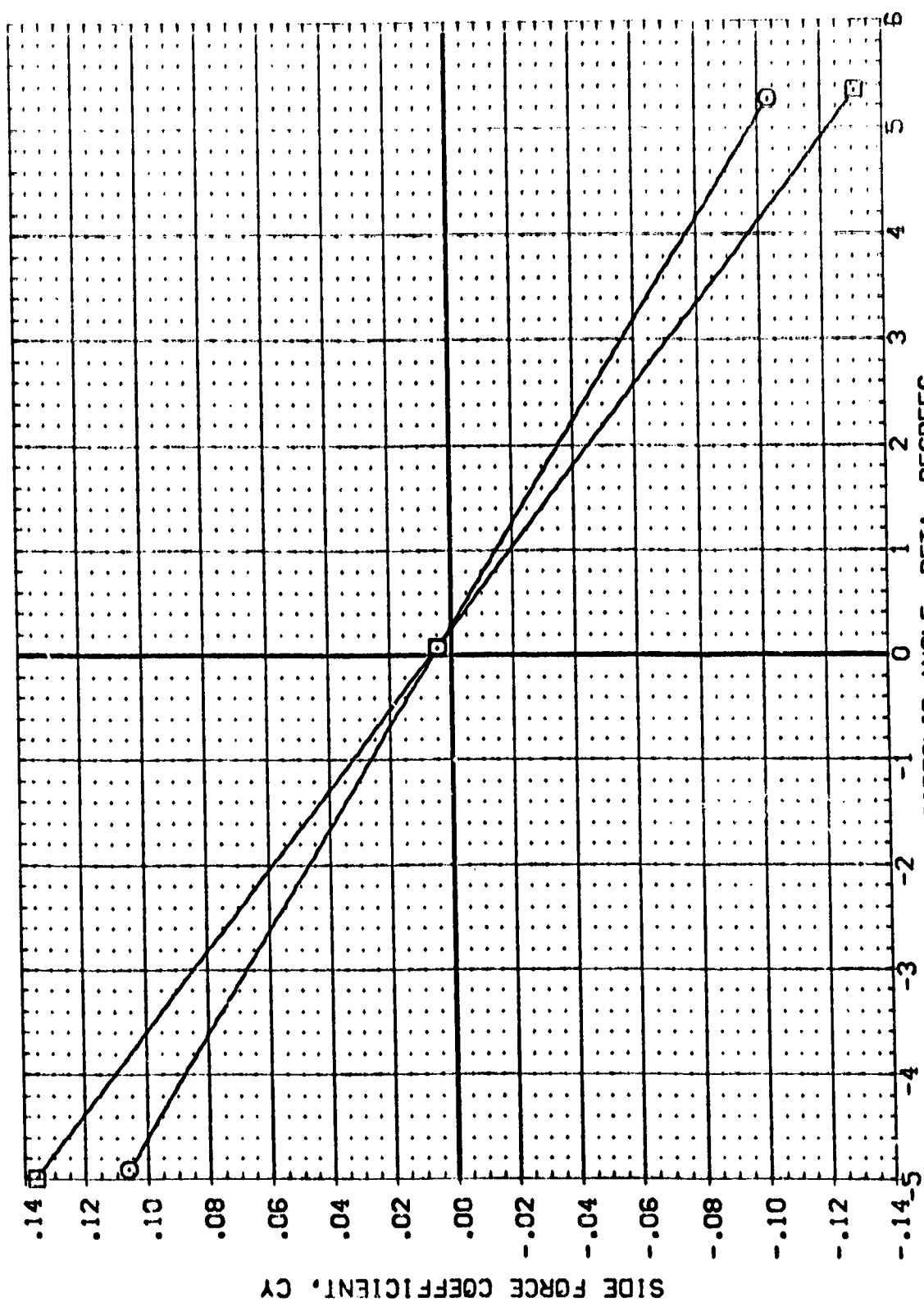
FIG.35 ORBITER LAT-OIR. DATA AT ALPHA=20 DEGS., ELEVON=-20 DEGS., MN=0.600, 0.902

(RBP033)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES ELEVON RUDFLR .000 .40.000

REFERENCE INFORMATION SREF 2.4210 LREF 29.8450 SREF 30.8450 XREF 32.2000 YREF 32.2000 ZREF 32.2000 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899

(RBP033)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 O .598 .000 .000
 □ .899 .000 .000

PARAMETRIC VALUES
 -4.000 ELEVON 40.000
 .000 RUOFLR

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 19.8450
 BREF 19.8450
 XREF 12.3000
 YREF 12.3000
 ZREF 12.3000
 SCALE

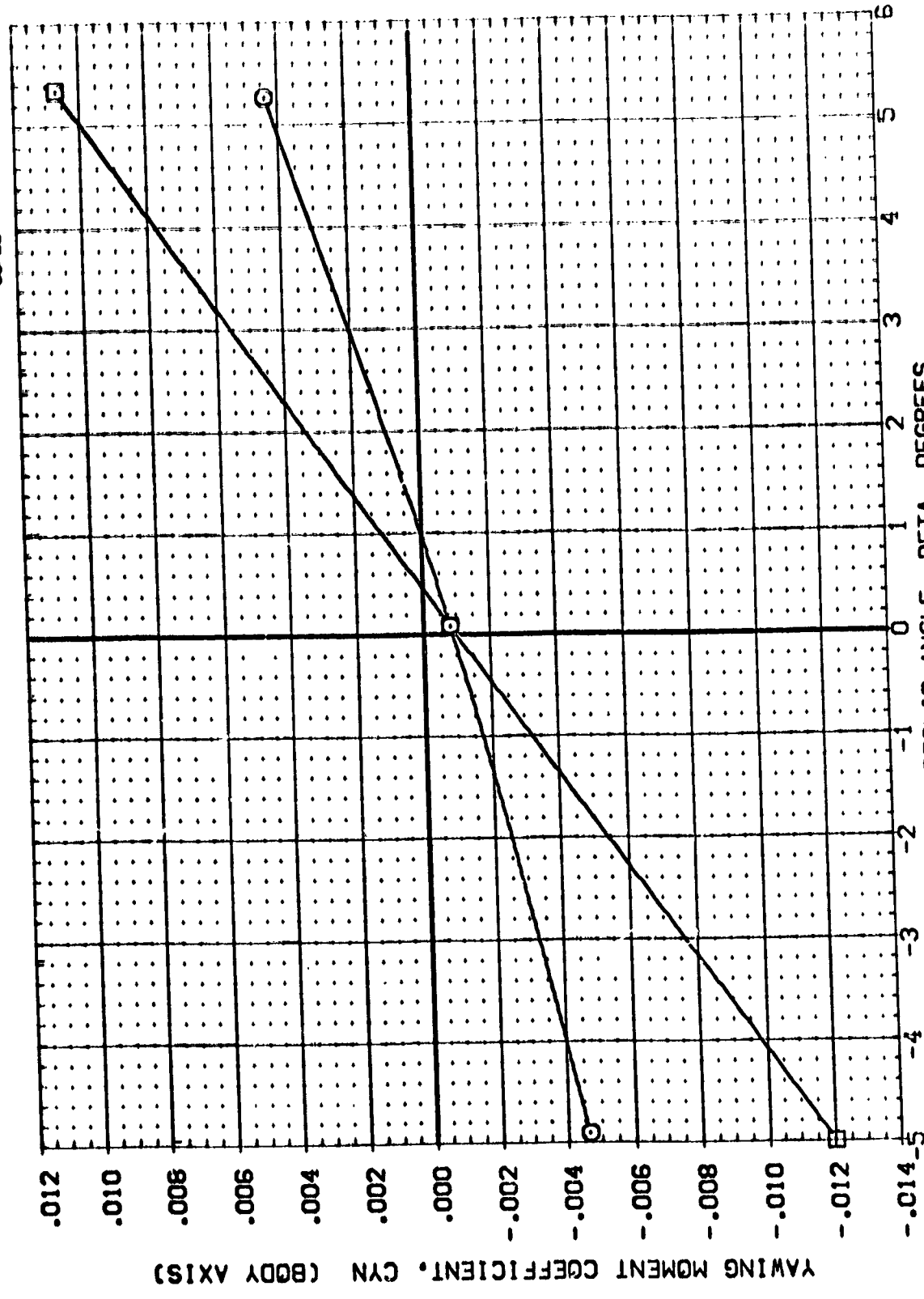
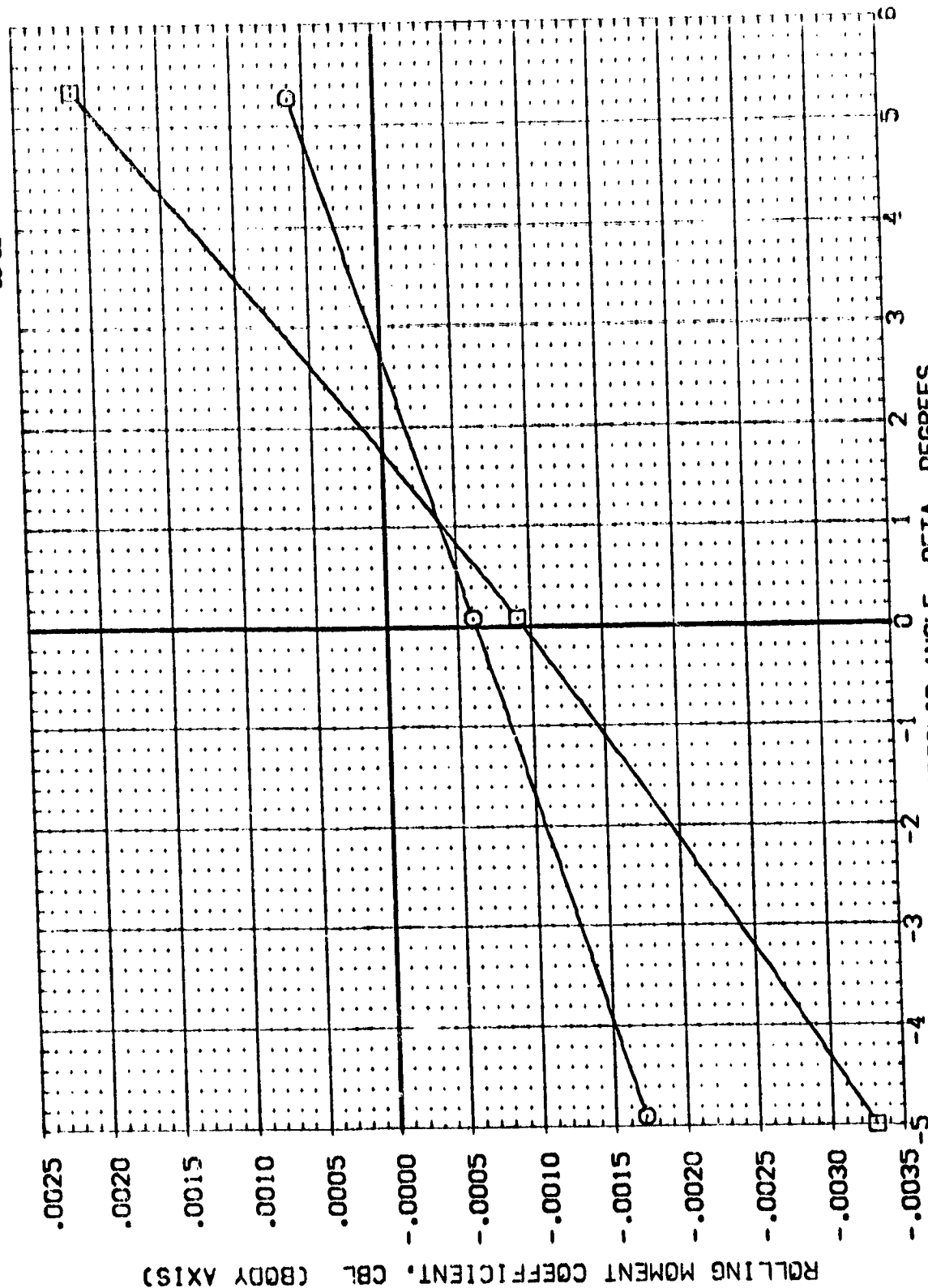


FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUOFLR=40 DEGS., YN=0.598,0.899
 SIDESLIP ANGLE, BETA, DEGREES
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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

| SYNCH | WACH | ALPHA | PARAMETRIC VALUES |
|-------|------|--------|-------------------|
| 0 | .598 | -4.000 | ELEVON |
| 0 | .598 | 0.000 | ROFLUR |
| 0 | .598 | 0.000 | 40.000 |



00035-5 -4 -3 -2 -1 0 SIDESLIP ANGLE, BETA, DEGREES
FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDFLP=40 DEGS., YN=0.598, 0.899
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(RBPO33)

REFERENCE INFORMATION
REF 2.42710
LIFT 30.6580
DRAG 30.6580
XREF 30.6580
YREF 30.6580
ZREF 30.6580
SCALE 1.000

SYMBOL MACH ALPHA RUDER PAIR TRIC VALUES
□ .598 .899 .000 .000 ELEVON 40.000
□ .000 .000 .000 .000 RUFLR 40.000

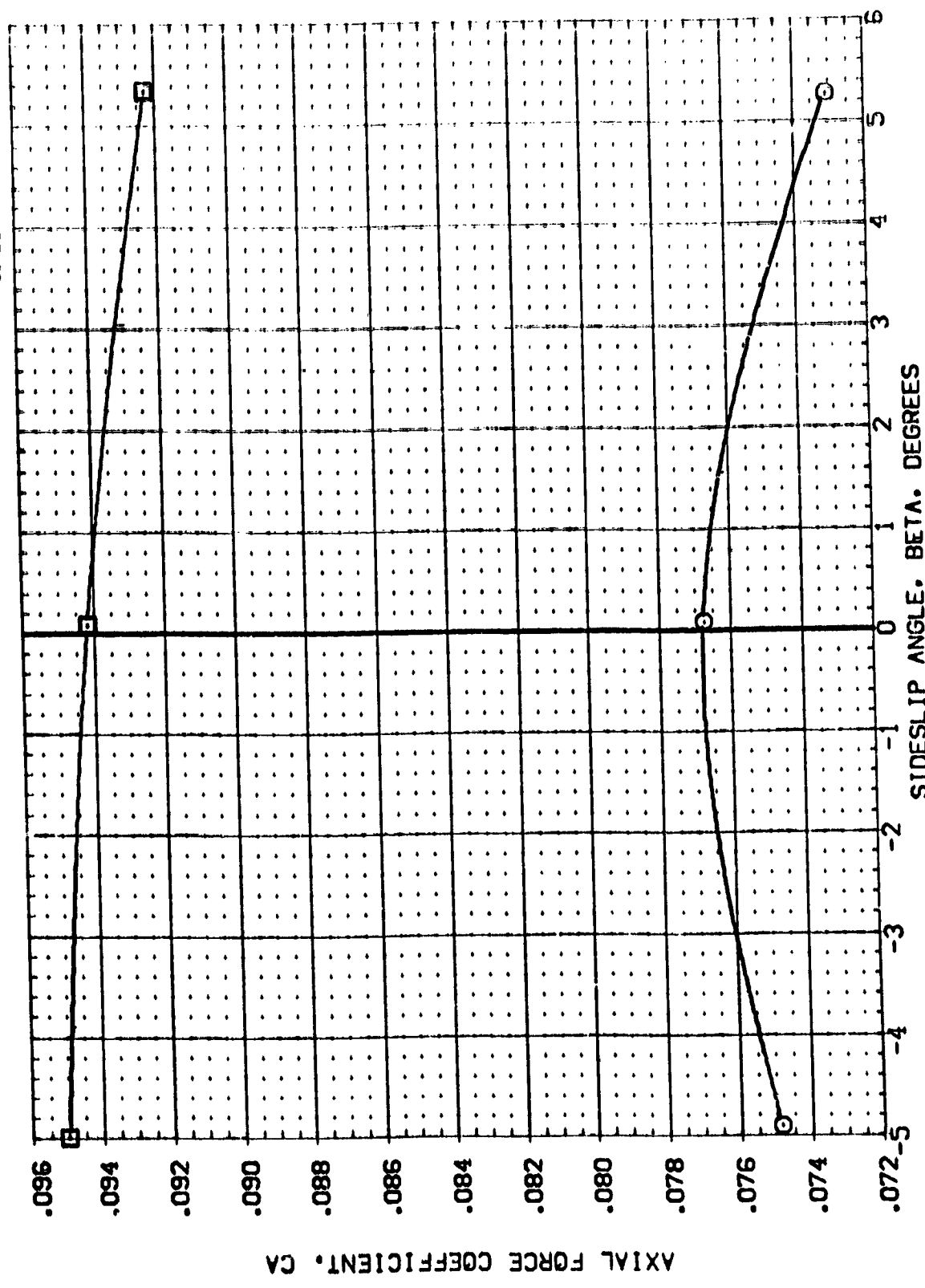


FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUFLR=40 DEGS., MN=0.598, 0.899
PAGE 29:

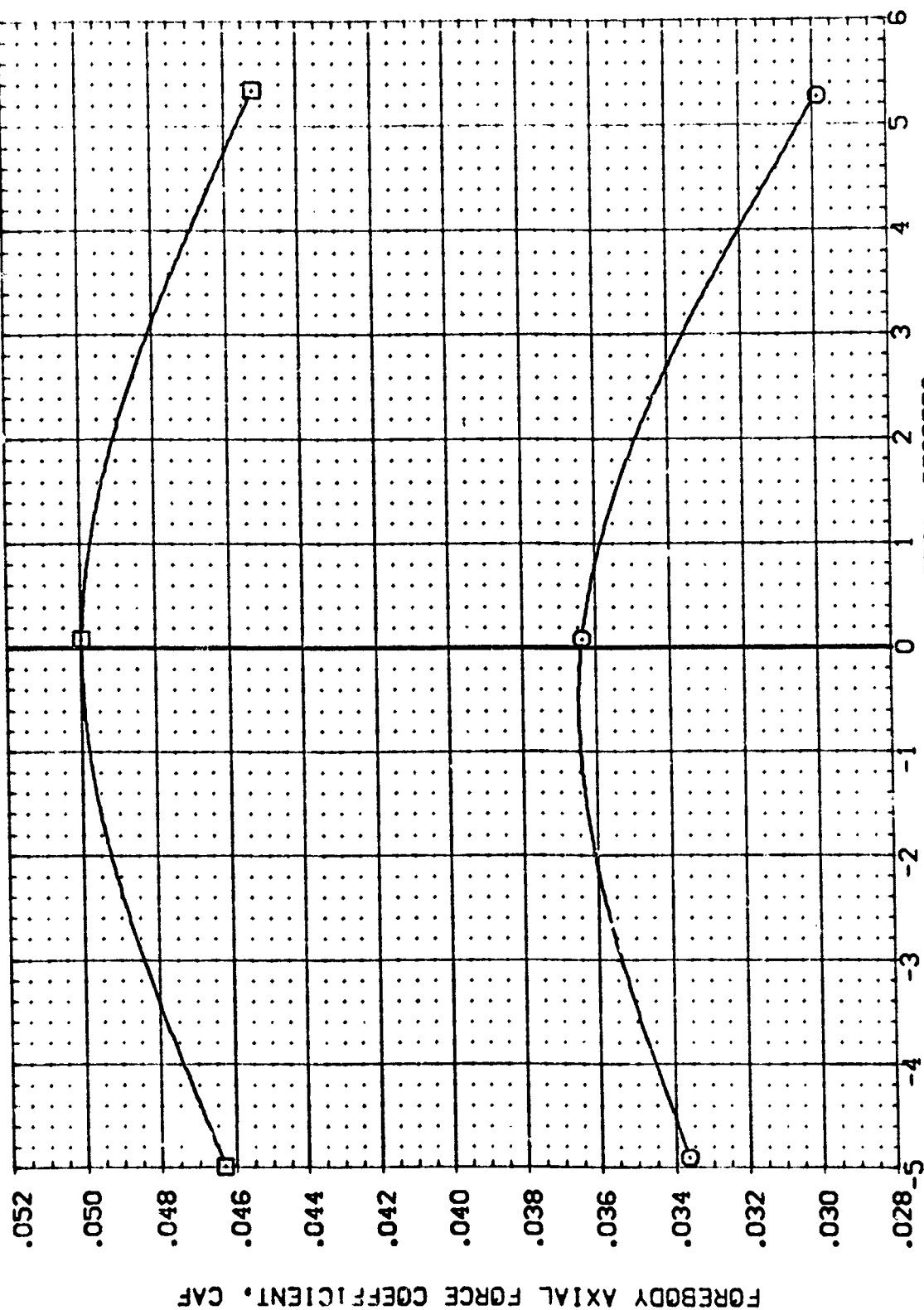
AMES 11-707 0A12 02A

(RBP033)

SYMBOL HAD-
 .598
 .899

PARAMETRIC VALUES
 ALPHA -4.000 ELEVON .000
 RUDDER .000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., MN=0.598,0.899, RUDFLR=40 DEGS.



(RBP033)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
○ .598
□ .899

PARAMETRIC VALUES
-4.000 ELEVON .000
.000 RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

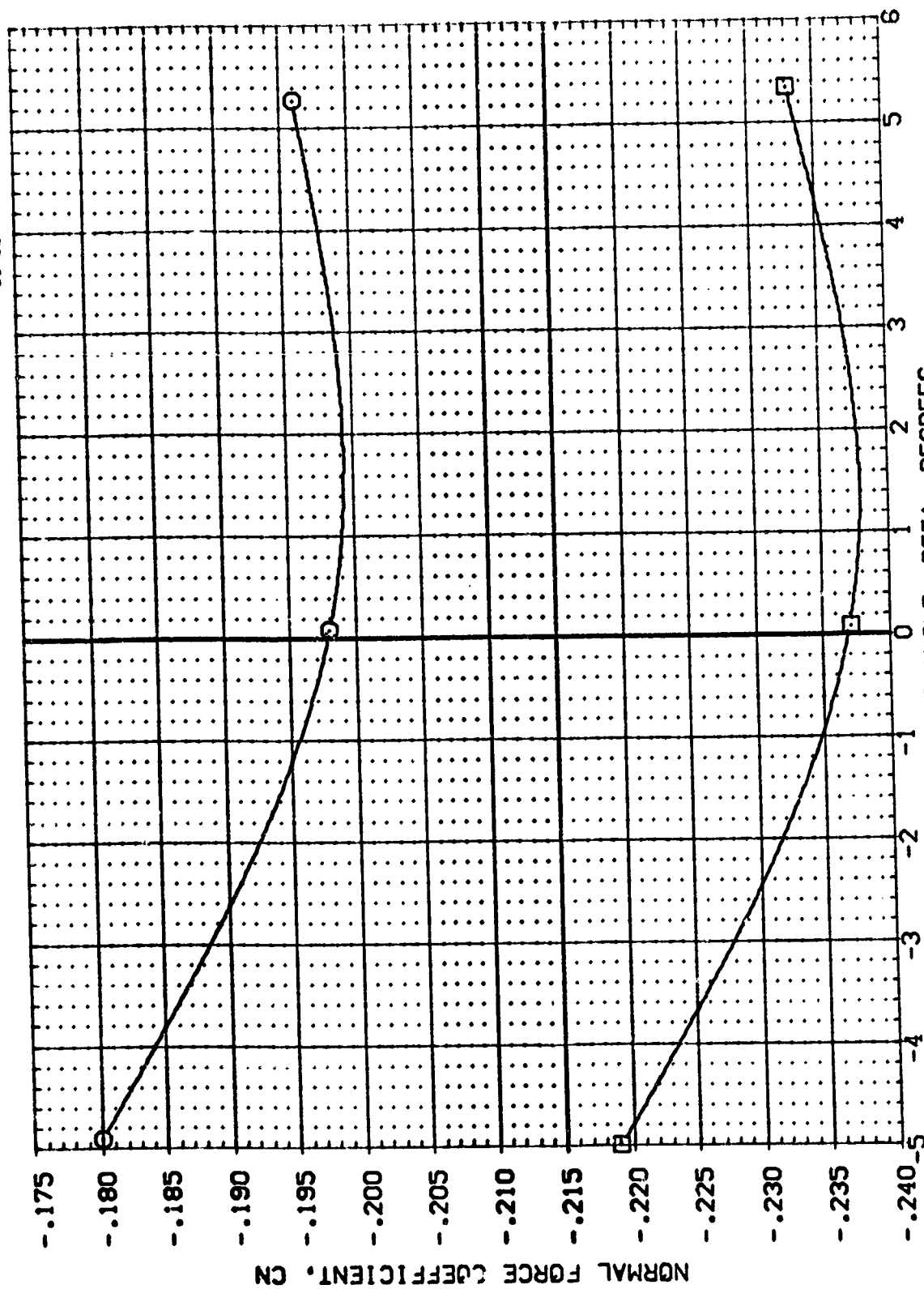


FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUOFLR=40 DEGS., MN=0.598,0.899



AMES 11-707 0A12 02A

(RBP033)

SYMBOL MACH ALPHA RUDDER
 □ .598 -4.000 .000
 □ .899 .000 40.000

PARAMETRIC VALUES
 ELEVON RUDFLR

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 YPRP 32.3000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0300

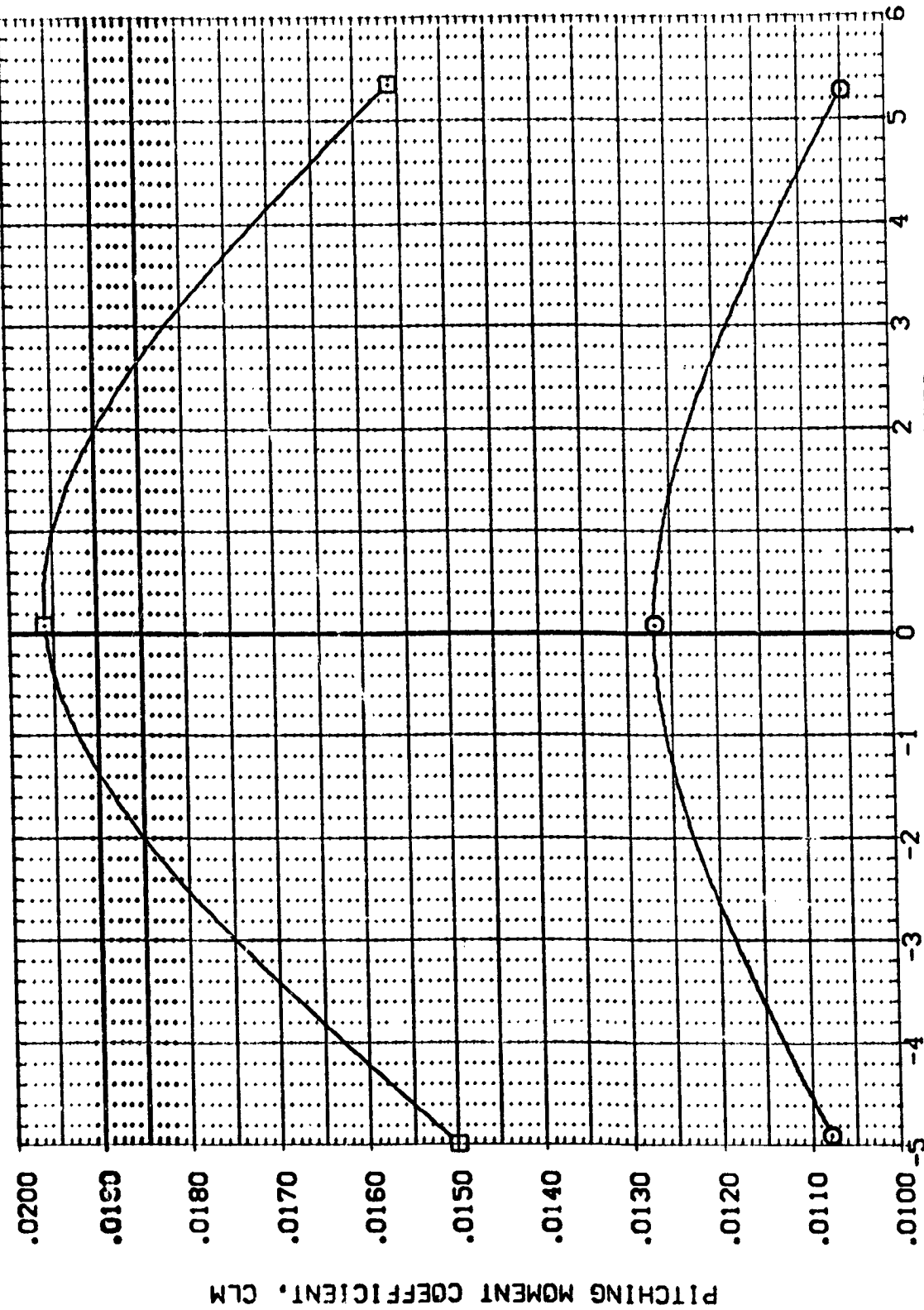


FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDFLR=40 DEGS., MN=0.598,0.899
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AMES 11-707 0A12 02A

(RBP033)

| | | | |
|--------------------------|--------------|-------------------|-----------------|
| SYMBOL | MACH | PARAMETRIC VALUES | |
| | .598
.899 | ALPHA
RUDDER | ELEVON
RUFLR |
| <input type="checkbox"/> | | -4.000
.000 | .000
40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.421C | SQ.FT. |
| LREF | 39.845C | IN. |
| BREF | 39.845C | IN. |
| WREF | 32.300C | IN. |
| YREF | .000C | IN. |
| ZREF | .000C | IN. |
| SCALE | .0300 | |

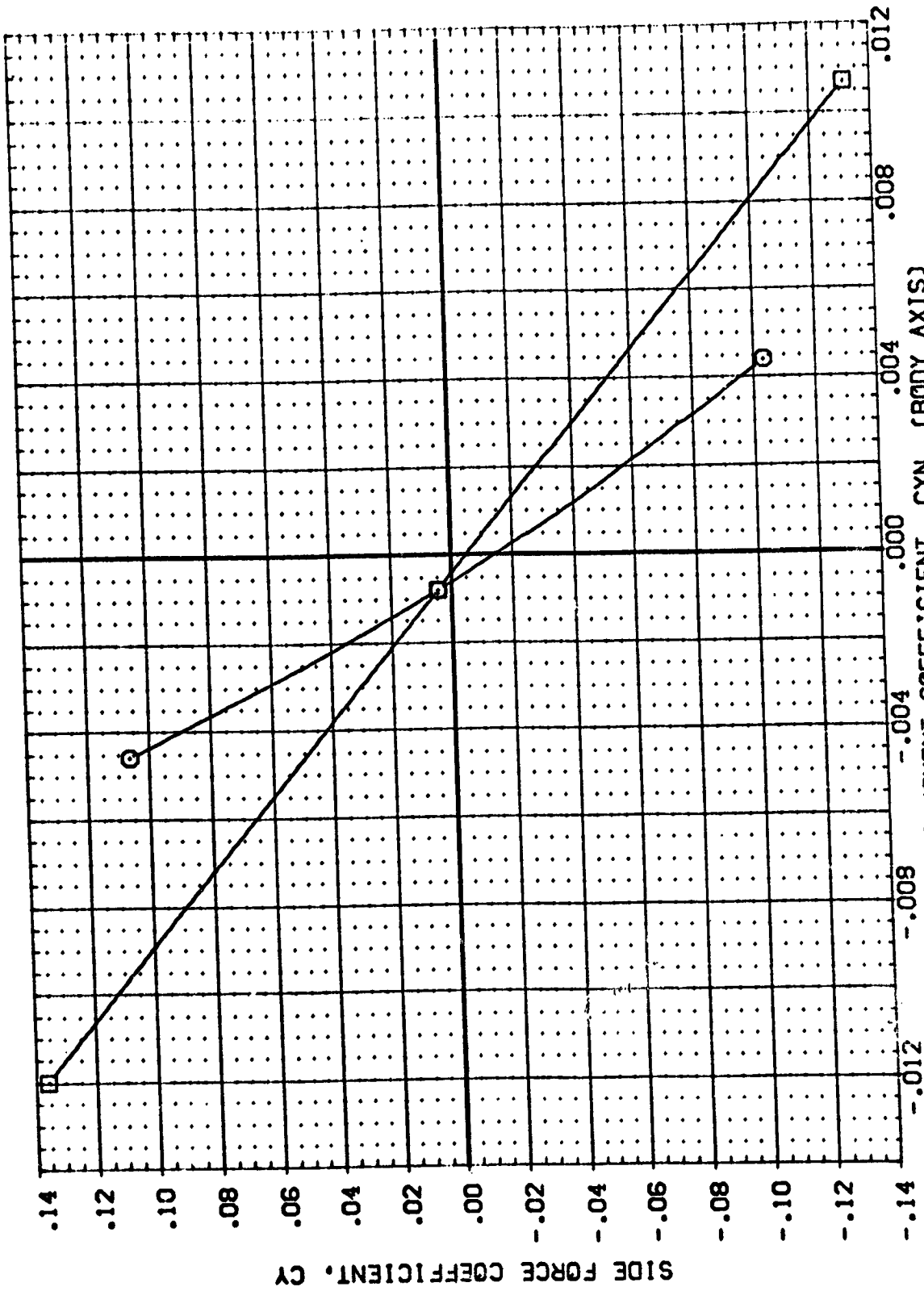


FIG.36 ORBITER LAT DIR. DATA AT ALPHA=-4 DEGS., RUDFLR=40 DEGS., MN=0.598,0.899
PAGE 295

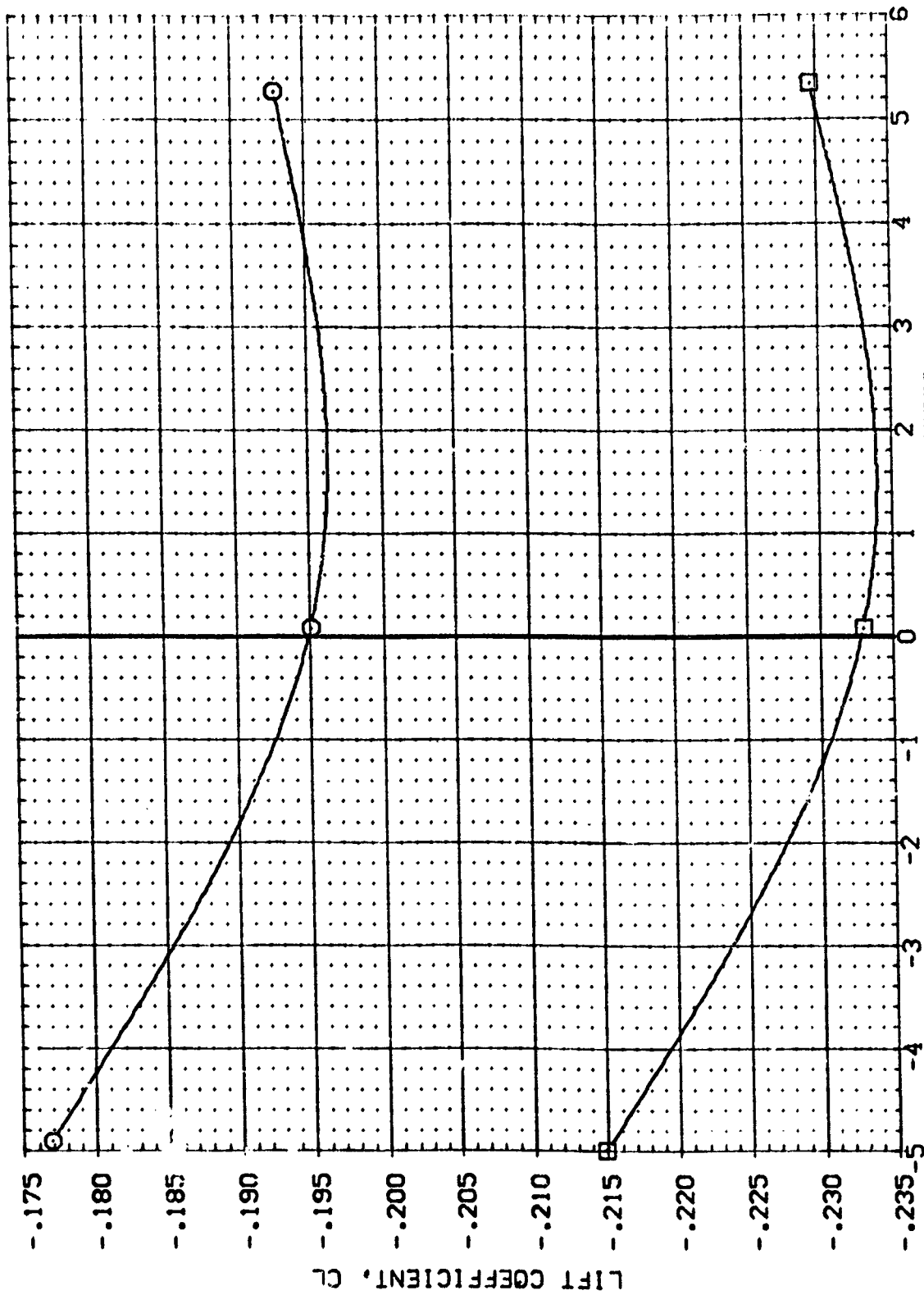
AMES 11-707 0A12 02A

(ABP033)

SYMBOL MACH ALPHA RUDDER
 ○ .598
 □ .899

PARAMETRIC VALUES
 -4.000 ELEVON
 .000 RUDDL
 40.000

REFERENCE INFORMATION
 SREF 2.4210 SS.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 X-REF 32.3000 IN.
 Y-REF .0000 IN.
 Z-REF .0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.36 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDL=40 DEGS., MN=0.598,0.899

(RBPO34)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .599 .000 .000
○ .901 .000 .000

PARAMETRIC VALUES
ELEVON .000
RUDFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XCRP 32.3000
YCRP .0000
ZCRP .0000
SCALE .0300

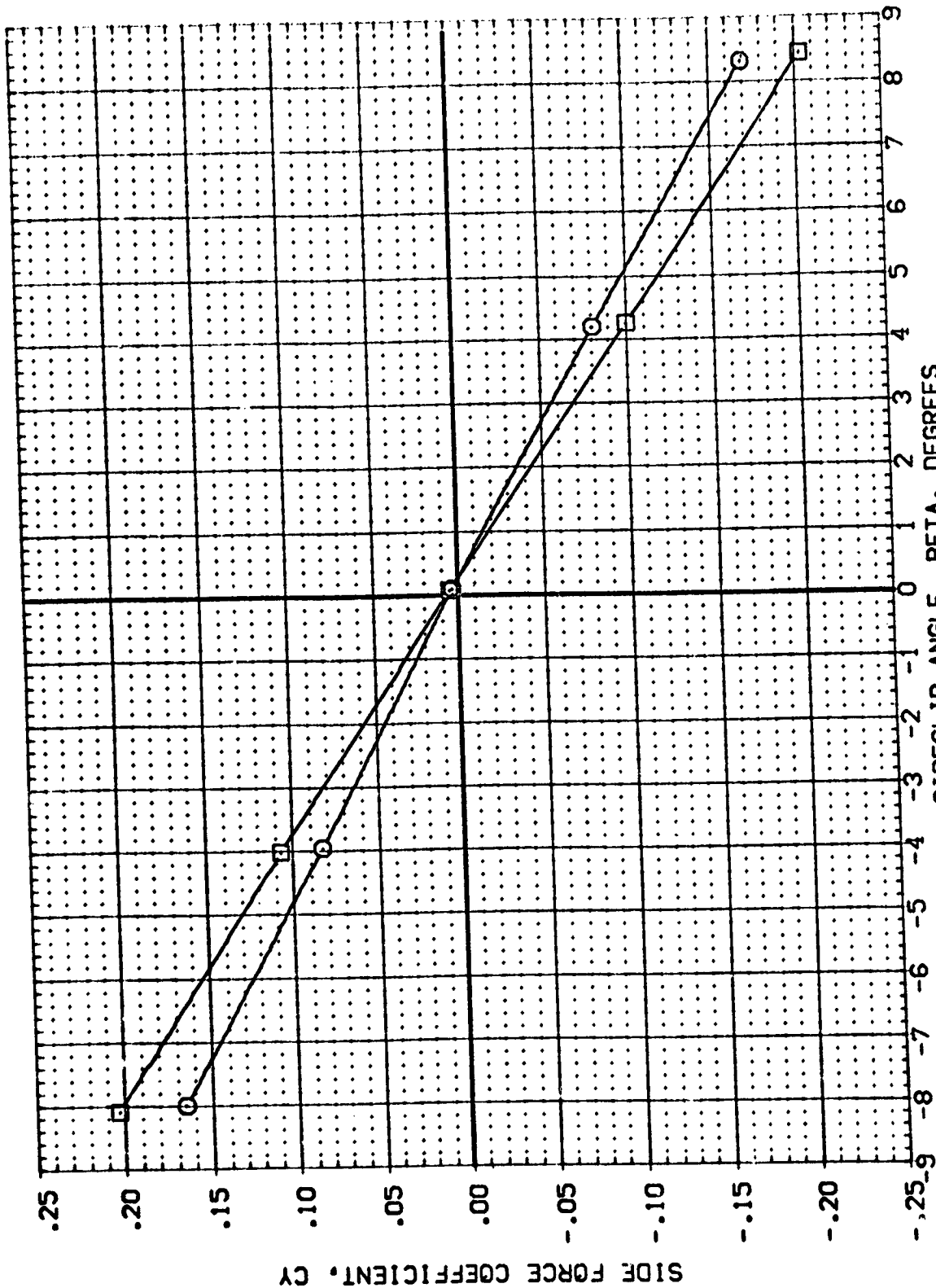


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDFLR=40 DEGS., MN=0.599,0.901

≡

AMES 11-707 0A12 02A

(RBP034)

SYMBOL HACH ALPHA PARAMETRIC VALUES
 O .559 .000 .000 ELEVON .000
 □ .501 .000 .000 RUFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

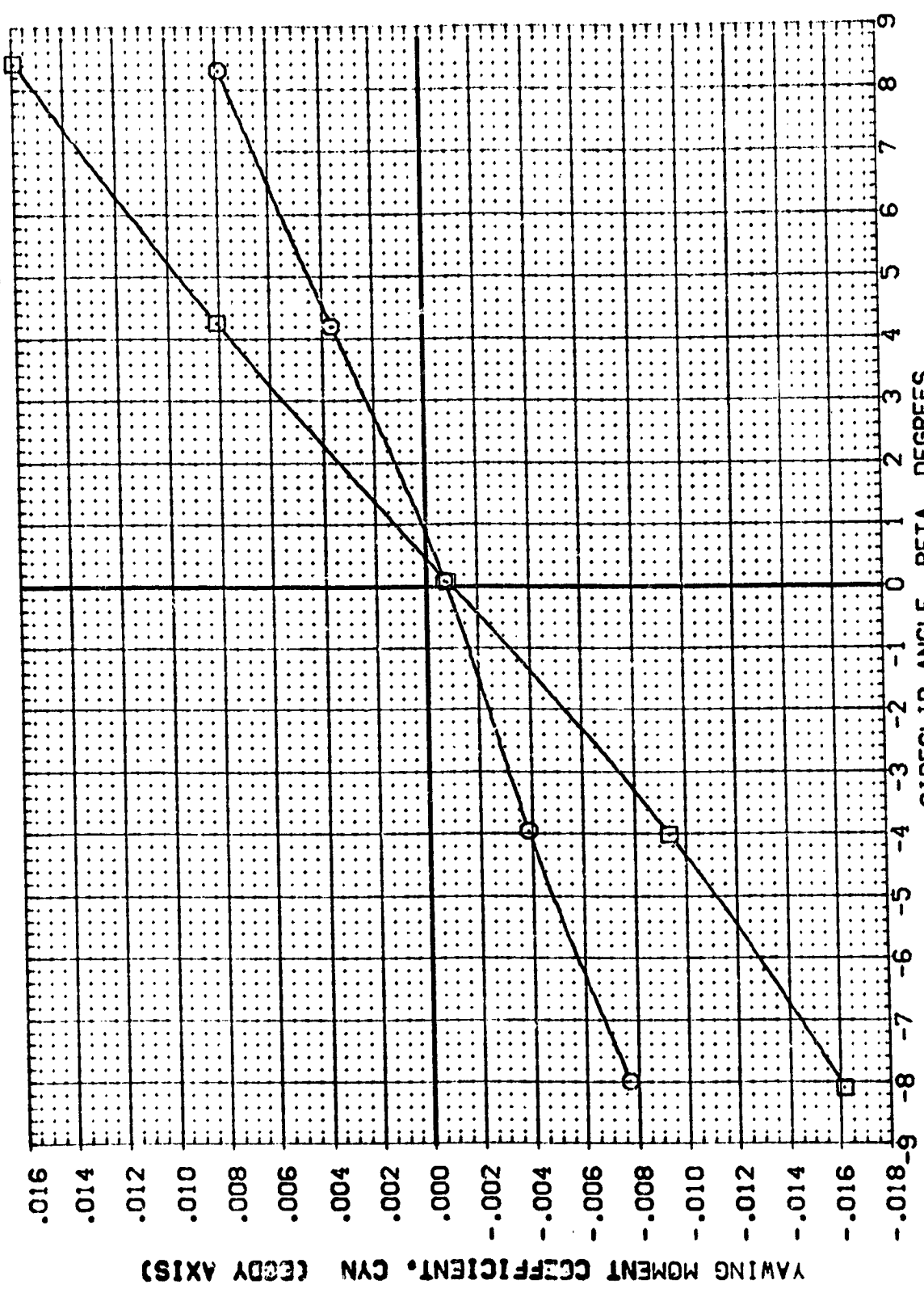


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUFLR=40 DEGS., MN=0.599,0.901
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(RBPO34)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .599 .000 .000
□ .901 .000 .000

PARAMETRIC VALUES
ELEVON .000
RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0000

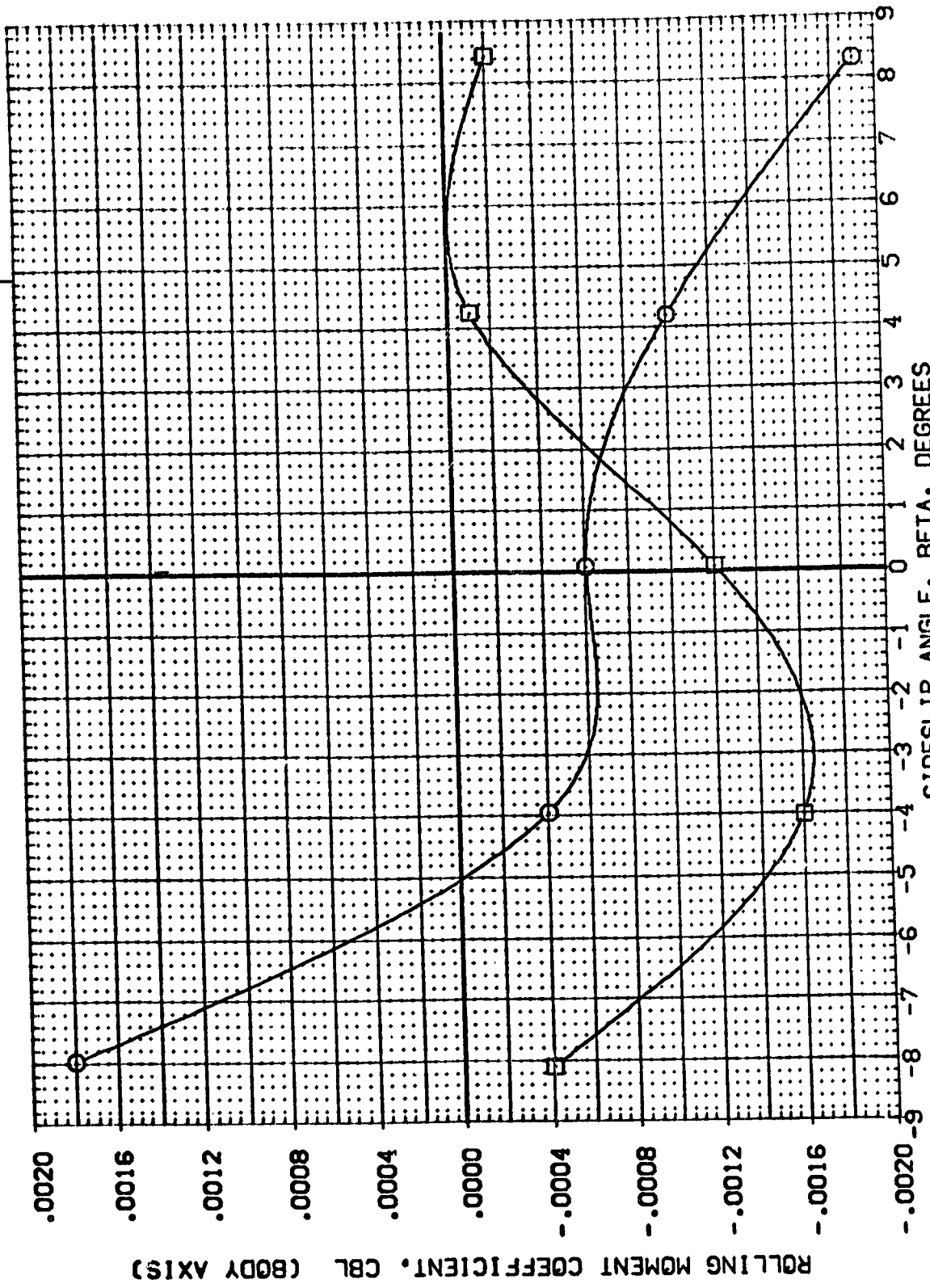


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUOFLR=40 DEGS., MN=0.599, 0.901



(RBP034)

AMES 11-707 0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | | |
|--------|------|-------------------|------|--------|
| | | ALPHA | ELEV | RUFLR |
| ○ | .599 | .000 | .000 | .000 |
| □ | .901 | .000 | .000 | 40.000 |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8493
BREF 39.8493
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

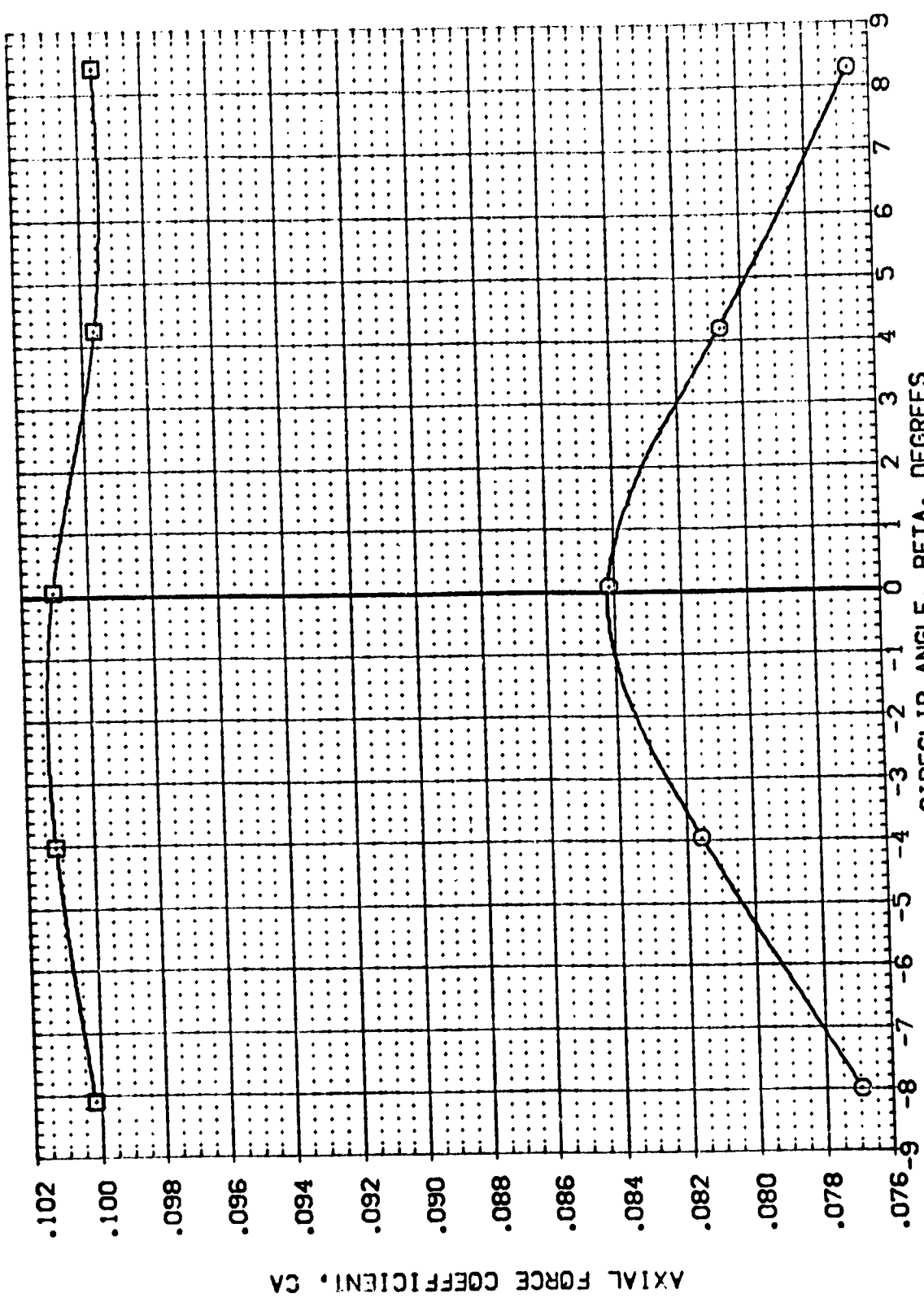


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUFLR=40 DEGS., MN=0.599,0.901



(RBP034)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
☐ .599 .000 .000
☐ .901 .000 .000

PARAMETRIC VALUES
 ELEVON .000
 RUDDER 40.000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8450 IN.
 BREF 39.8450 IN.
 XPRP 32.3000 IN.
 YPRP .0000 IN.
 ZPRP .0000 IN.
 SCALE .0300

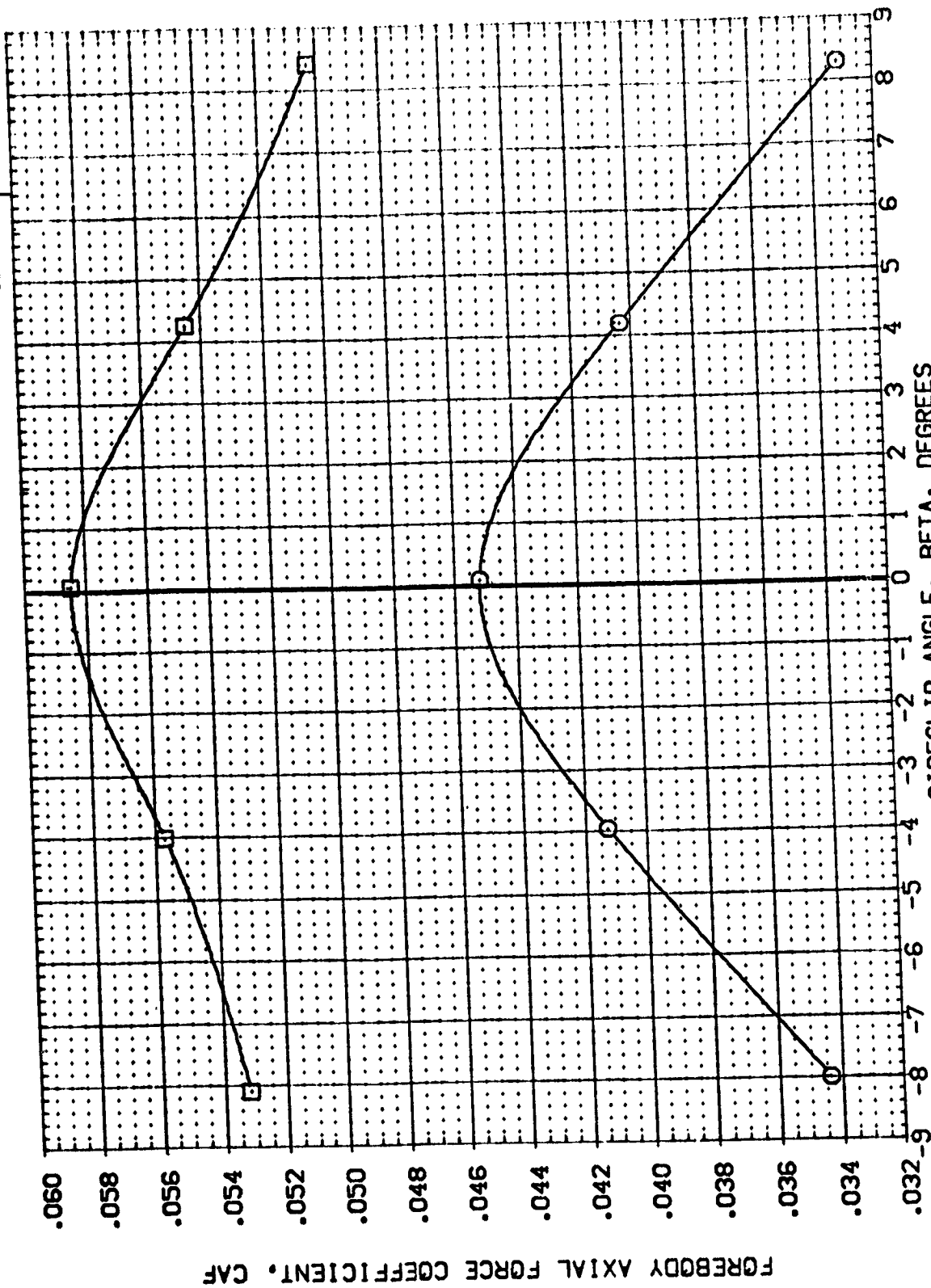


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDDER=40 DEGS., MN=0.599,0.901
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 30

(RBP034)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
SREF 2.4210 SQ. FT.
LREF 38.8450
BREF 39.9450
XMRP 32.3000
YMRP
ZMRP
SCALE

PARAMETRIC VALUES
MACH .599 ALPHA .000 ELEVON .000
RUDER .000 RUOFLR 40.000

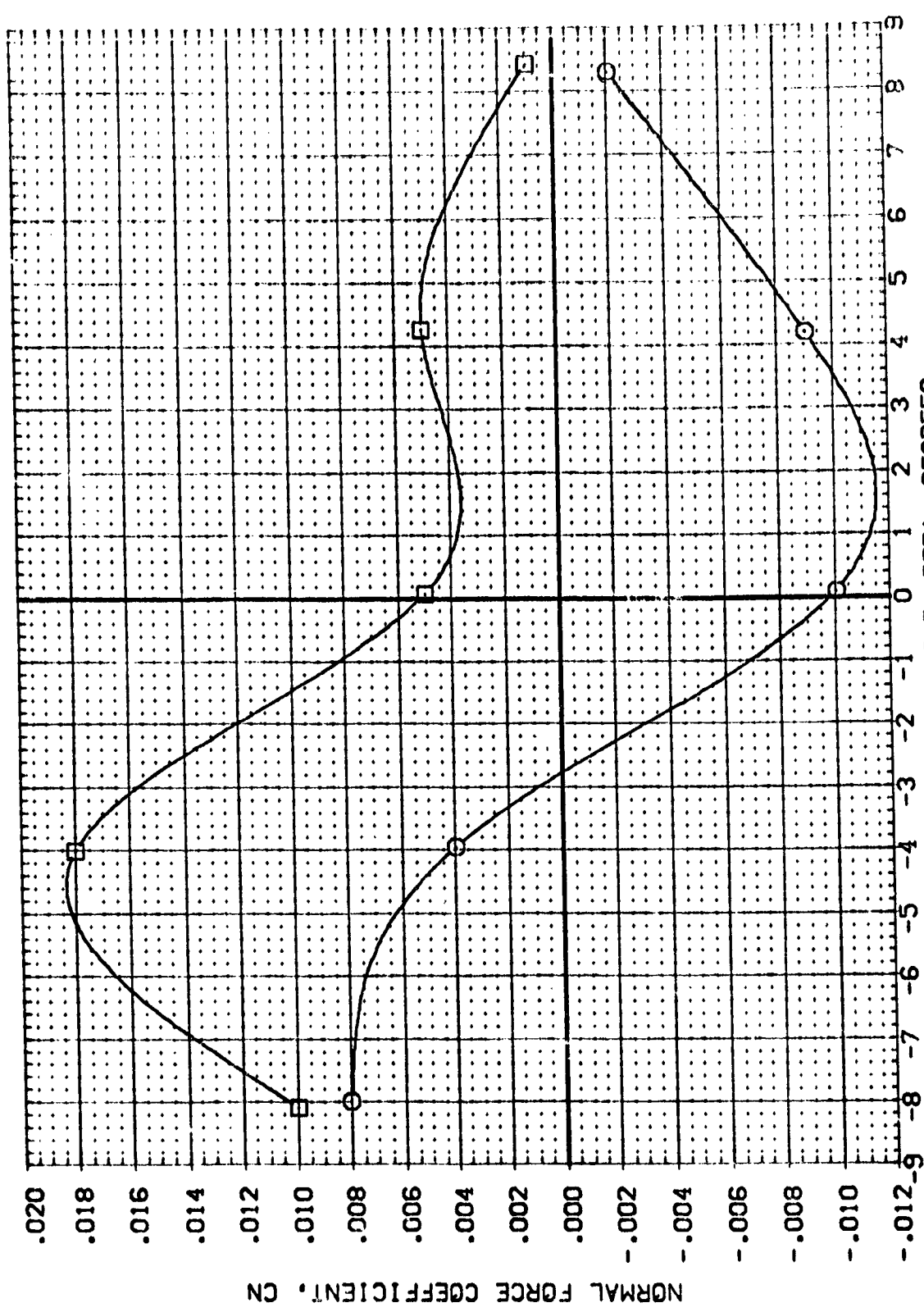


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUOFLR=40 DEGS., MN=0.599, 0.901
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(RBP034)

AMES 11-707 0A12 02A

| | | | | | |
|--------|------|-------|-------------------|--------|--------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDFLR |
| ○ | .599 | .000 | .000 | .000 | .000 |
| □ | .901 | .000 | .000 | .000 | .000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4213 | SG.FT. |
| LSREF | 35.8415 | |
| BSREF | 35.8415 | |
| VSREF | 32.3 | |
| WREF | 1.0 | |
| ZREF | 1.0 | |
| SCALE | 1.0 | |

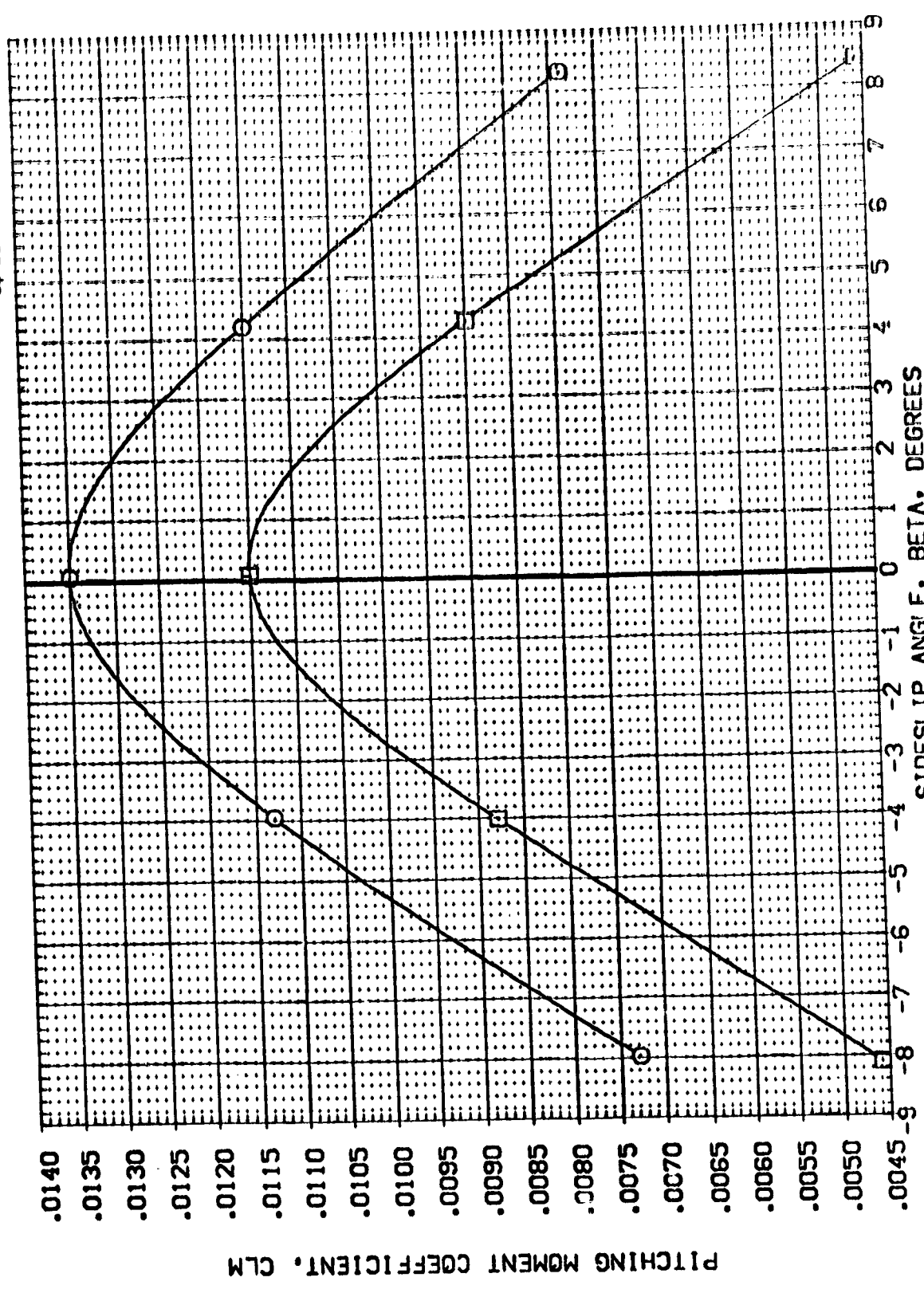


FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDFLR=40 DEGS., MW=0.599, 0.901

AMES 11-707 CA12 CZA

OL
70845

565
566
567

ALPHA
ROGER

| PARAMETRIC VALUES | |
|-------------------|--------|
| .000 | ELEVEN |
| .000 | RJOSLR |
| | 40.000 |
| | .000 |

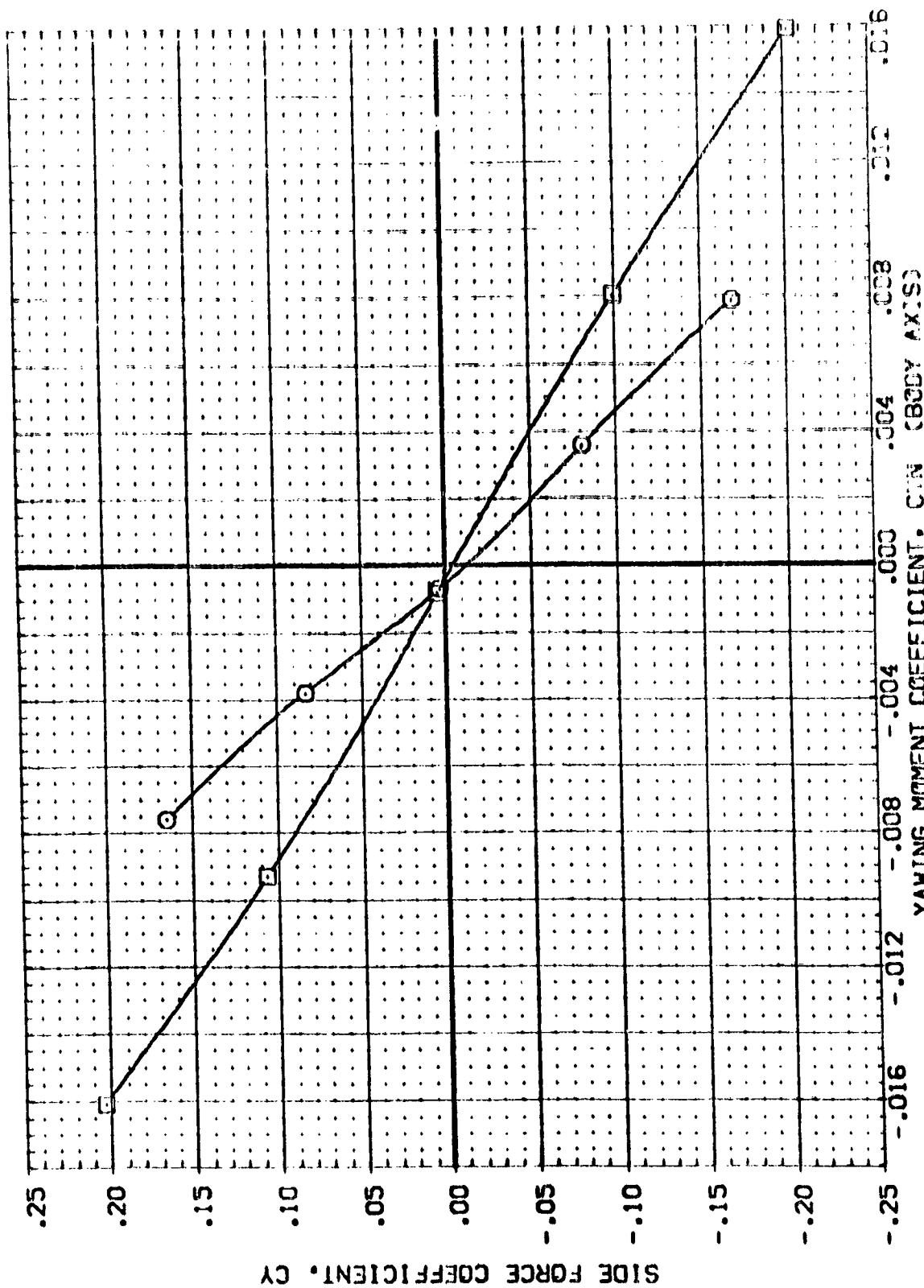
[illegible]

FIG.37 ORBITER LAT-DIR. DATA AT ALPHA=0 DEGS., RUDFLR=40 DEGS., VN=0.599, D.30:

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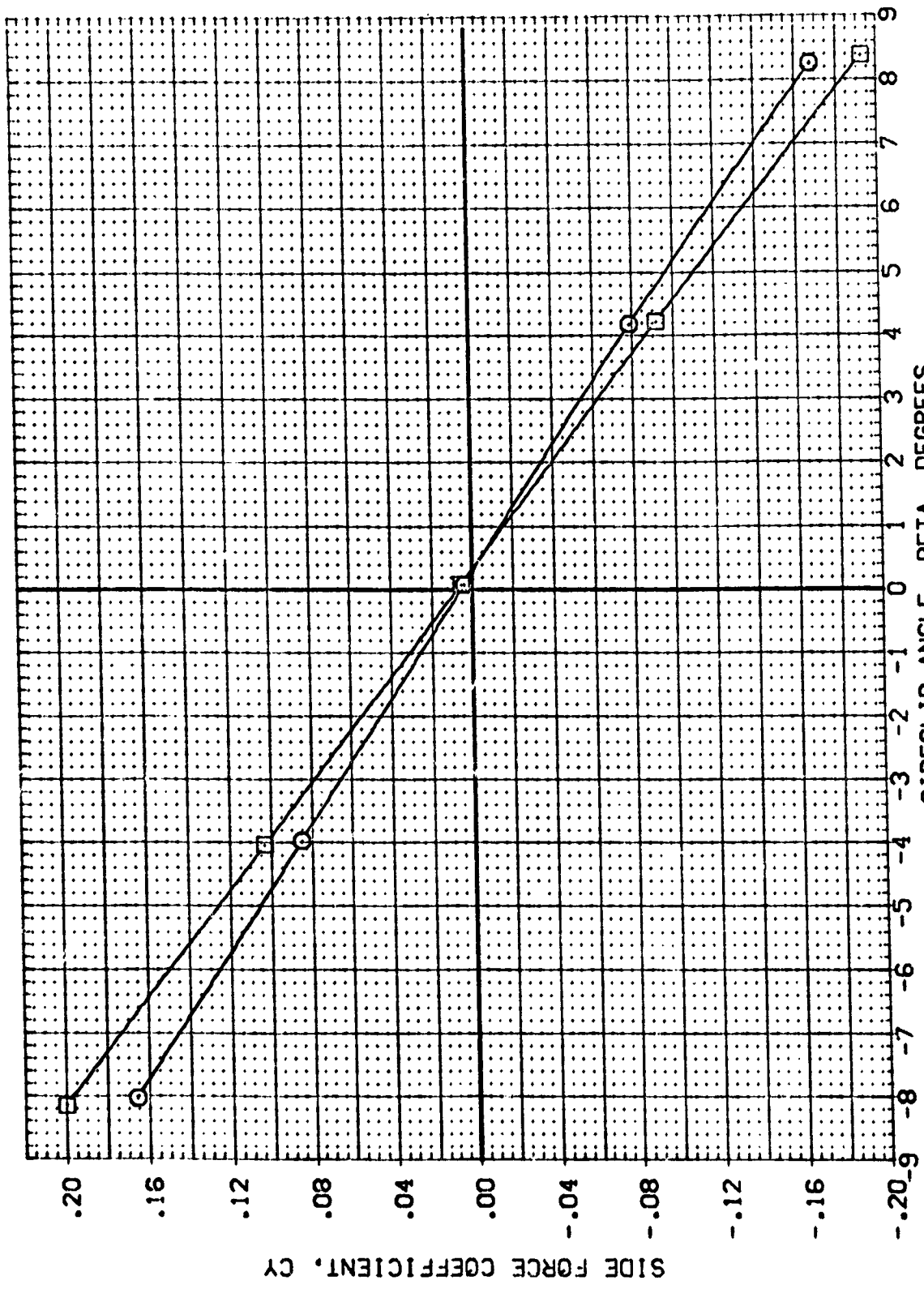
AMES 11-707 0A12 02A

(RBP035)

SYMBOL
○ □

MACH .598
ALPHA .903
R-DOER .000
ELEVON .000
RUFLR 40.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.38 ORBITER LAT-QIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598,0.903



(RBP035)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .598 .903
PARAMETRIC VALUES
S.000 ELEVON .000
.000 RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

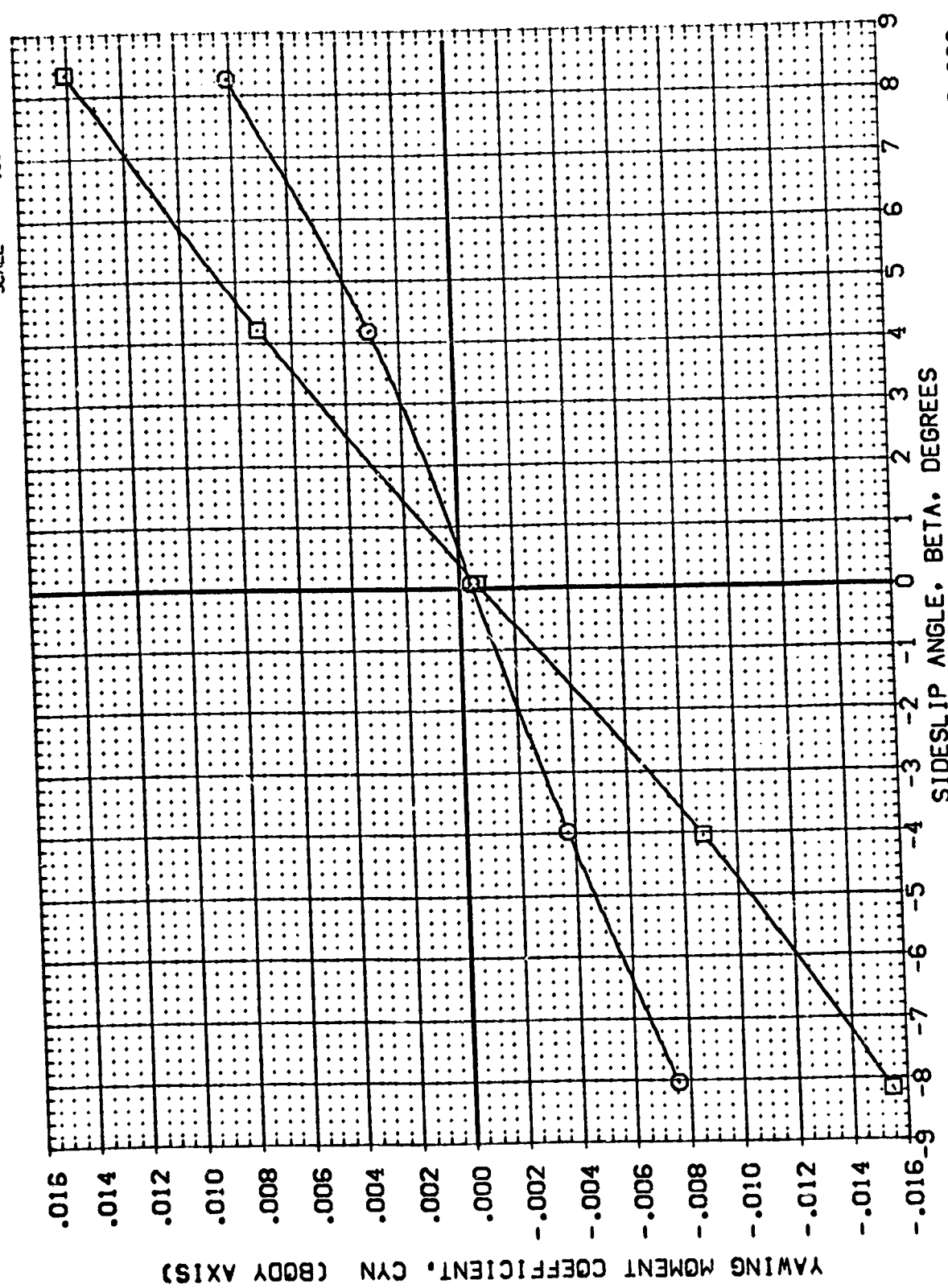


FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUOFLR=40 DEGS., MN=0.598, 0.903
PAGE 307

≡

(RBP035)

AMES 11-707 OA12 02A

SYMBOL MACH ALPHA RUDDER
 □ .598 .000
 □ .903 .000

PARAMETRIC VALUES
 ELEVON .000
 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 33.0000
 EREF 30.0000
 XREF 32.0000
 YREF .0000
 ZREF .0000
 SCALE .0300

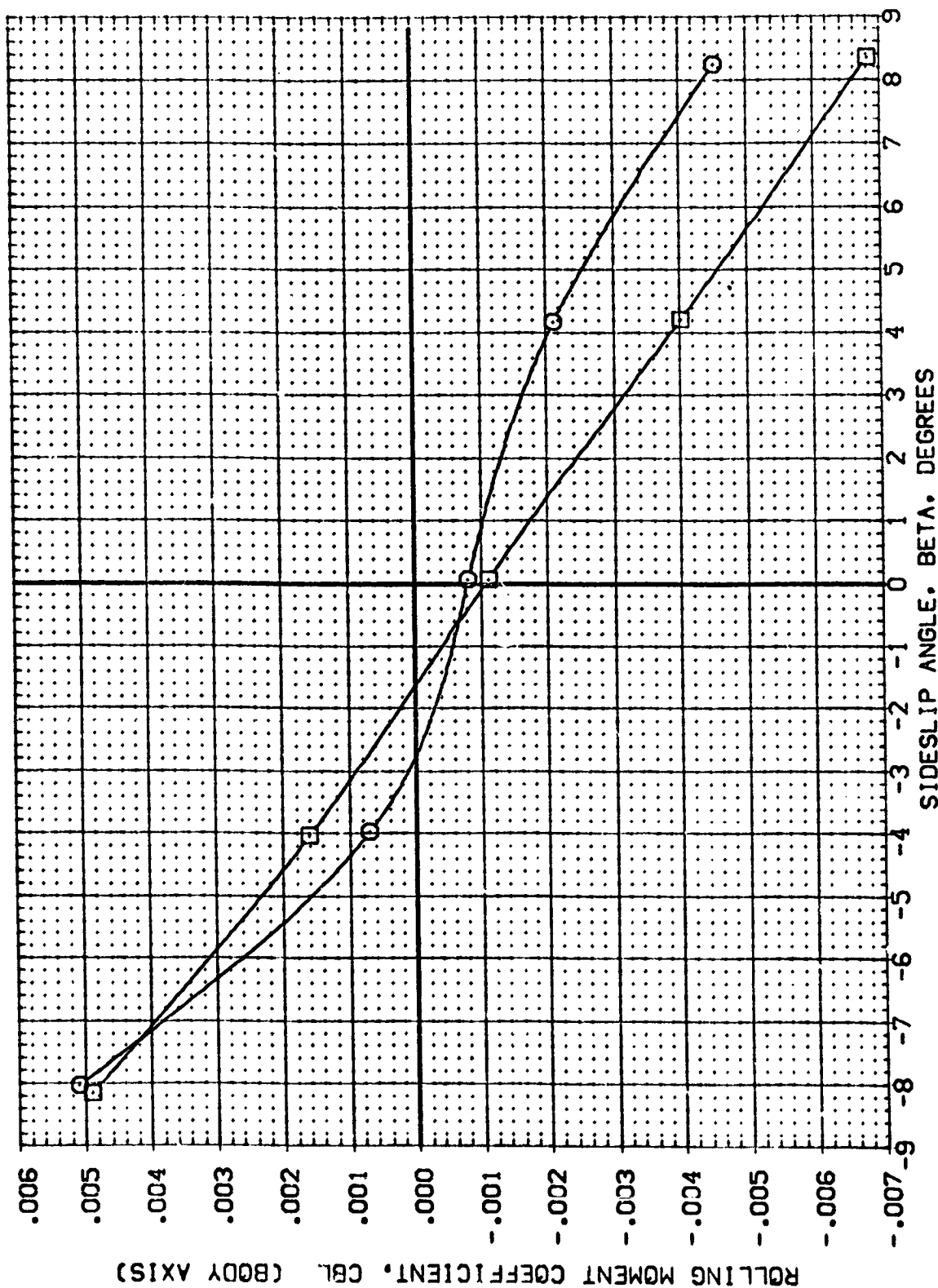


FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.903



(RBP035)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
 SQ.FT.
 2.4210
 38.8490
 38.8490
 32.3000
 .0000
 .0000
 .0300
 .0300

SYMBOL MACH ALPHA RUDDER
 .598 .903
 5.000 .000
 40.000 .000
 40.000 .000

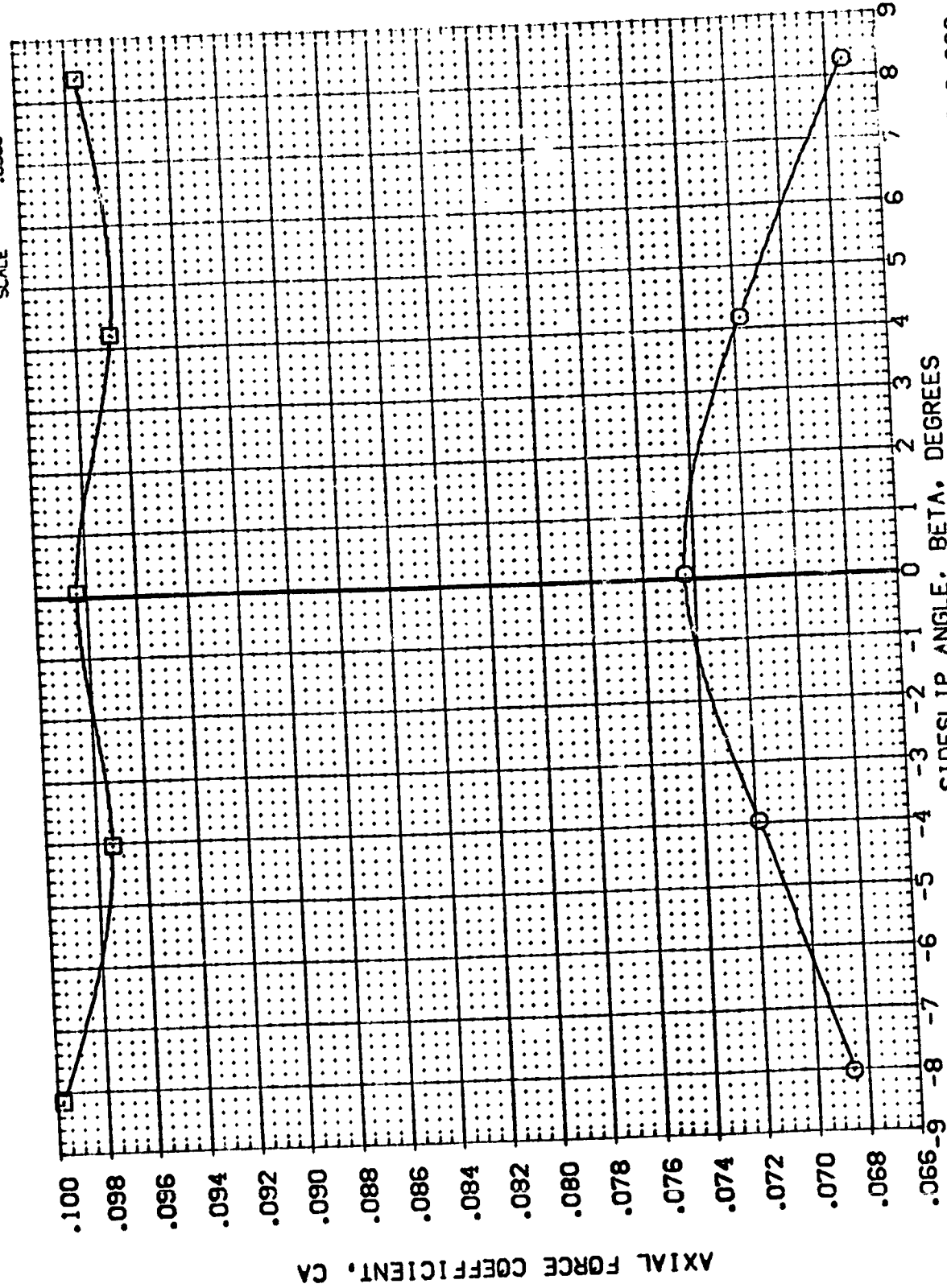


FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.903
 PAGE 309

==

(RRP035)

AMES 11-707 0A12 02A

SYMBOL
□

MACH .598
.903

PARAMETRIC VALUES
ALPHA 5.000
ELEVON .000
RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 23.6190
XREF 23.6190
YREF 32.0000
ZREF 1.0000
SCALE .0000

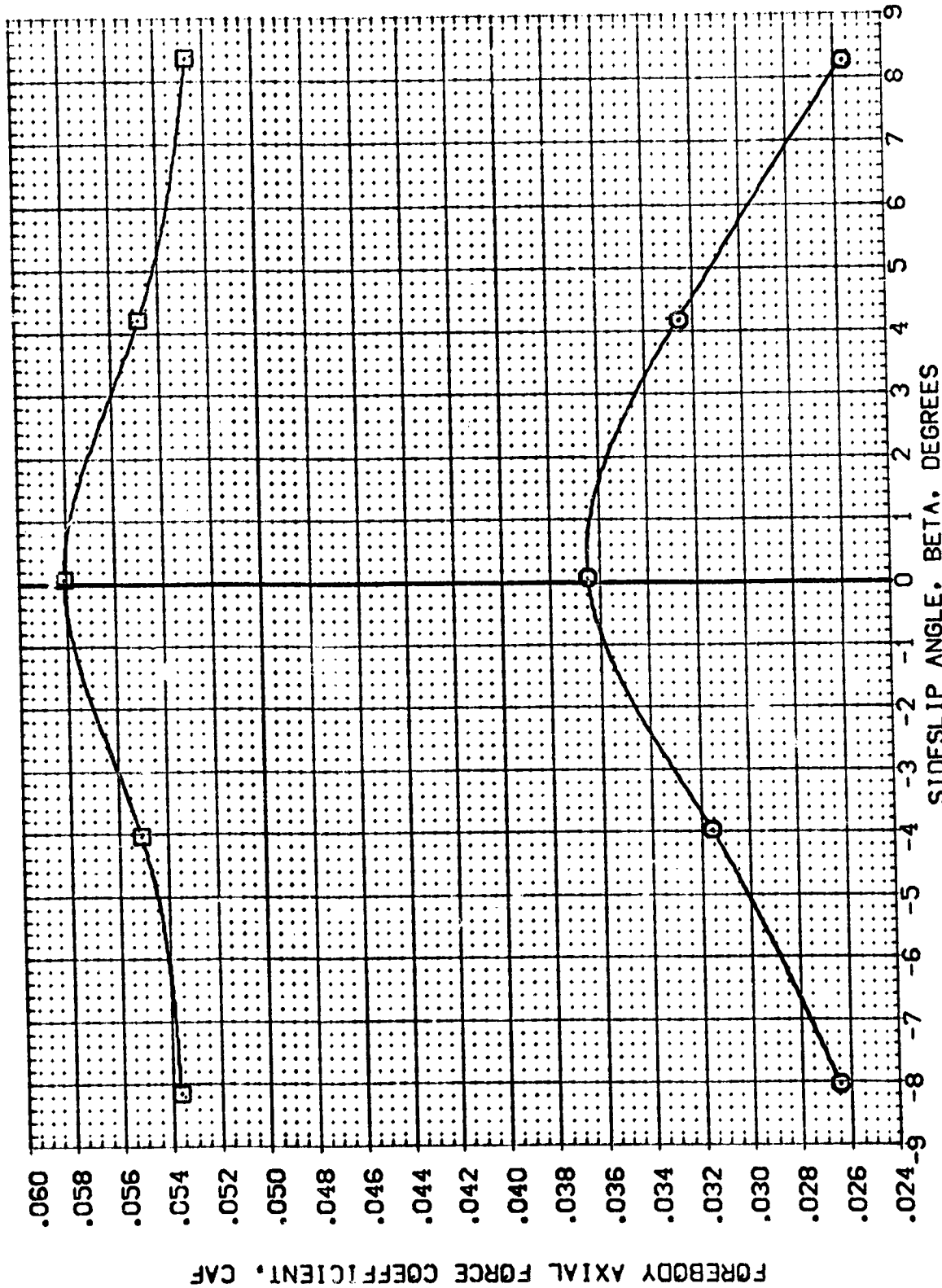


FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDLR=40 DEGS., MN=0.598,0.903

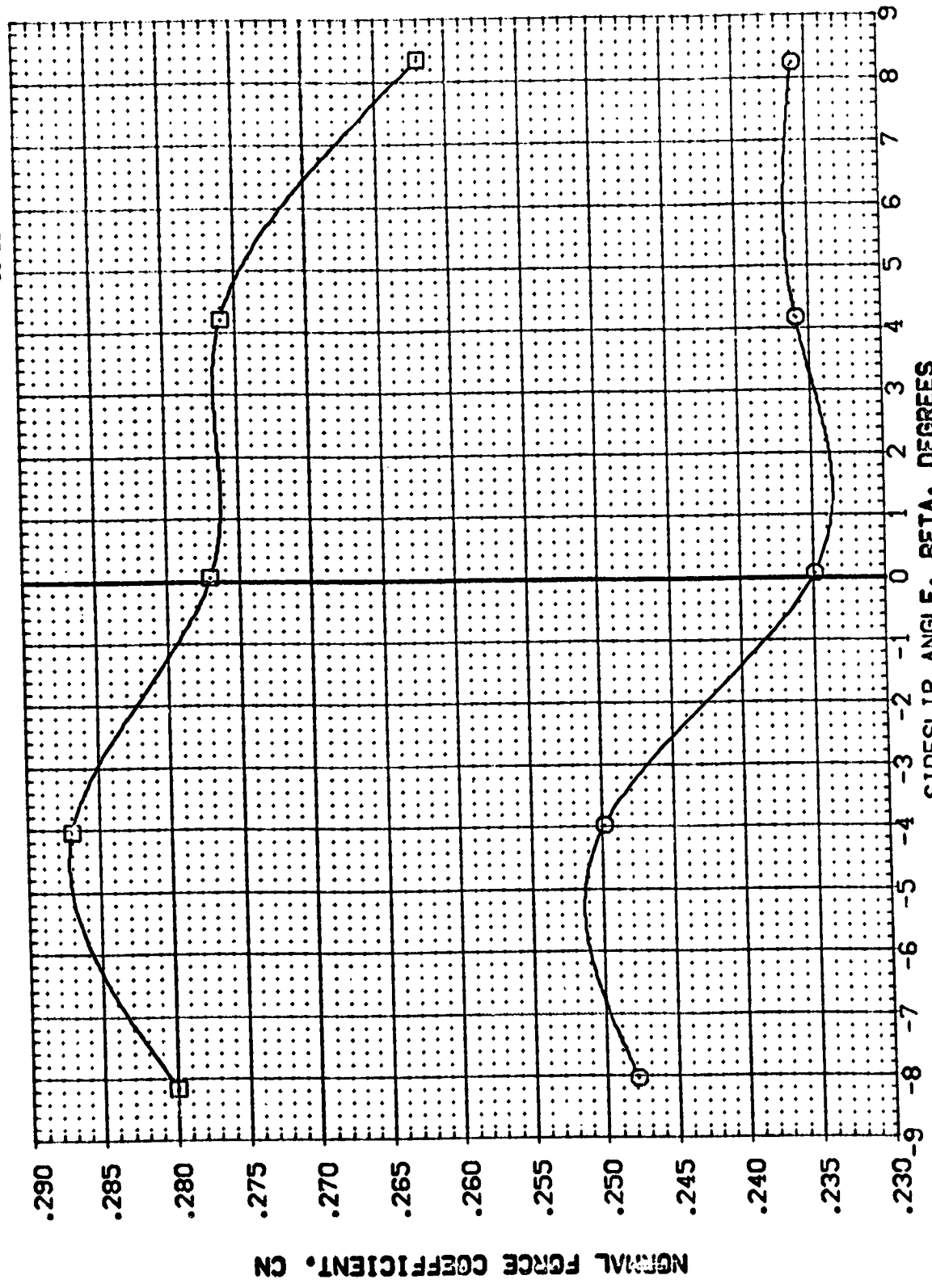
(RBP035)

AMES 11-707 0A12 02A

| | | | | | |
|--------|------|-------|-------------------|--------|--------|
| SYMBOL | MOH | ALPHA | PARAMETRIC VALUES | ELEVON | .000 |
| ○ | .598 | | 5.000 | RUDFLR | 40.000 |
| □ | .503 | RUDER | .000 | | |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SO.FT. |
| UREF | 39.8450 | IN. |
| BREF | 39.8450 | IN. |
| XREF | 32.3000 | IN. |
| YREF | .0000 | IN. |
| ZREF | .0000 | IN. |
| SCALE | .0300 | SCALE |



SIDESLIP ANGLE, BETA, DEGREES

FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598,0.903
PAGE 311

(RBP035)

SYNOPSIS

WCH 528 528

ALPHA
R:ODER

PARAMETRIC VALUES
5.000 ELEVON
.000 RUOFLR

40.000
1.000

| REFERENCE INFORMATION | | SO.FT. |
|-----------------------|---------|--------|
| SREF | 2.4210 | N. |
| LREF | 39.8490 | N. |
| BREF | 39.8490 | N. |
| XREF | 32.3000 | N. |
| YREF | .0000 | N. |
| ZREF | .0000 | N. |
| SCALE | .0000 | SCALE |

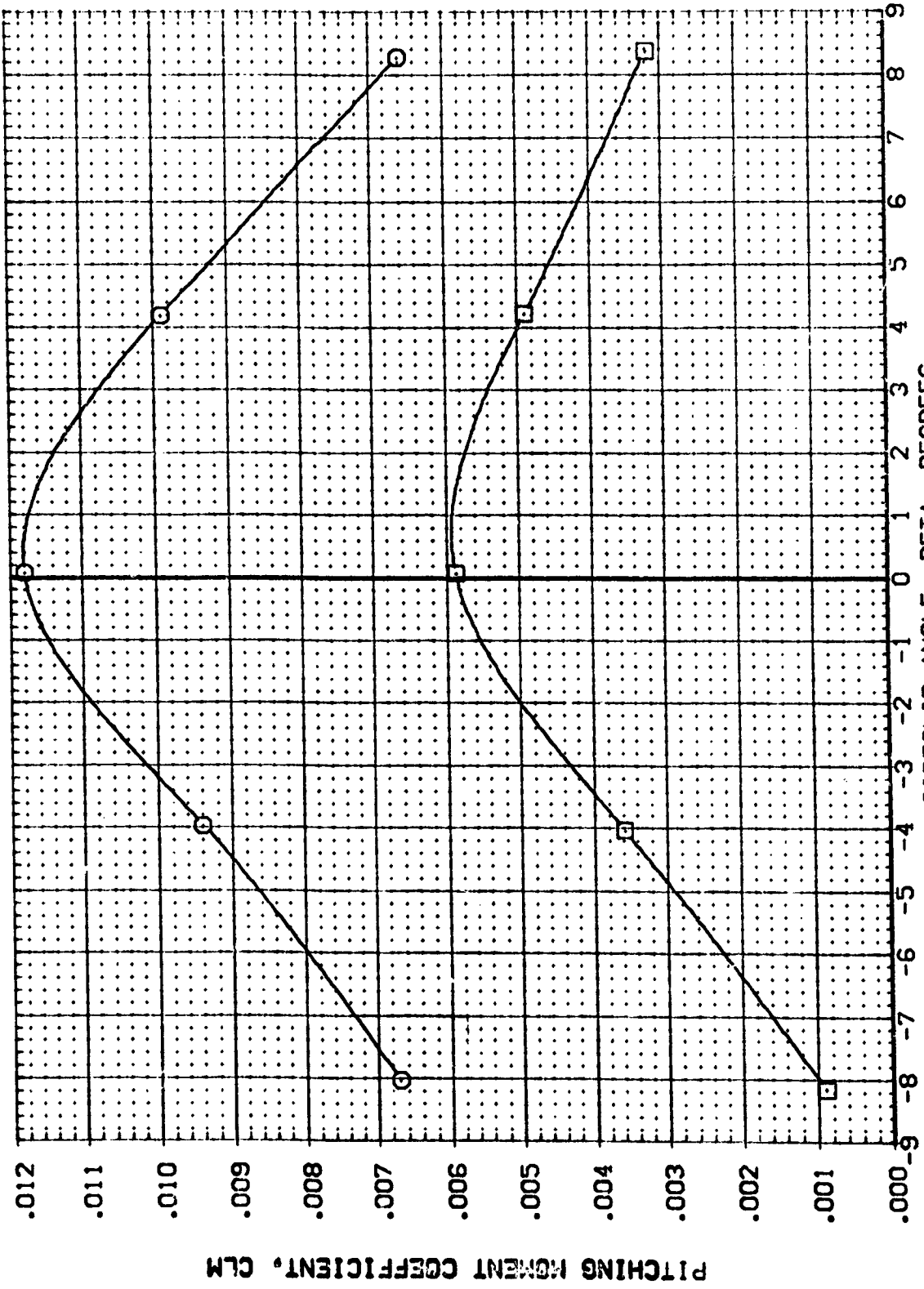


FIG. 38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.903

(RBP035)

AMES 11-707 0A12 02A

| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDFLR | SCALE |
|--------|------|-------|-------------------|--------|--------|-------|
| ○ | .598 | | 5.000 | .000 | .000 | |
| □ | .903 | RUDER | .000 | 40.000 | | |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SG.FT. |
| LREF | 39.8450 | IN. |
| BREF | 39.8450 | IN. |
| XMRP | 32.3000 | IN. |
| YMRP | .0000 | IN. |
| ZMRP | .0000 | IN. |
| SCALE | .0300 | SCALE |

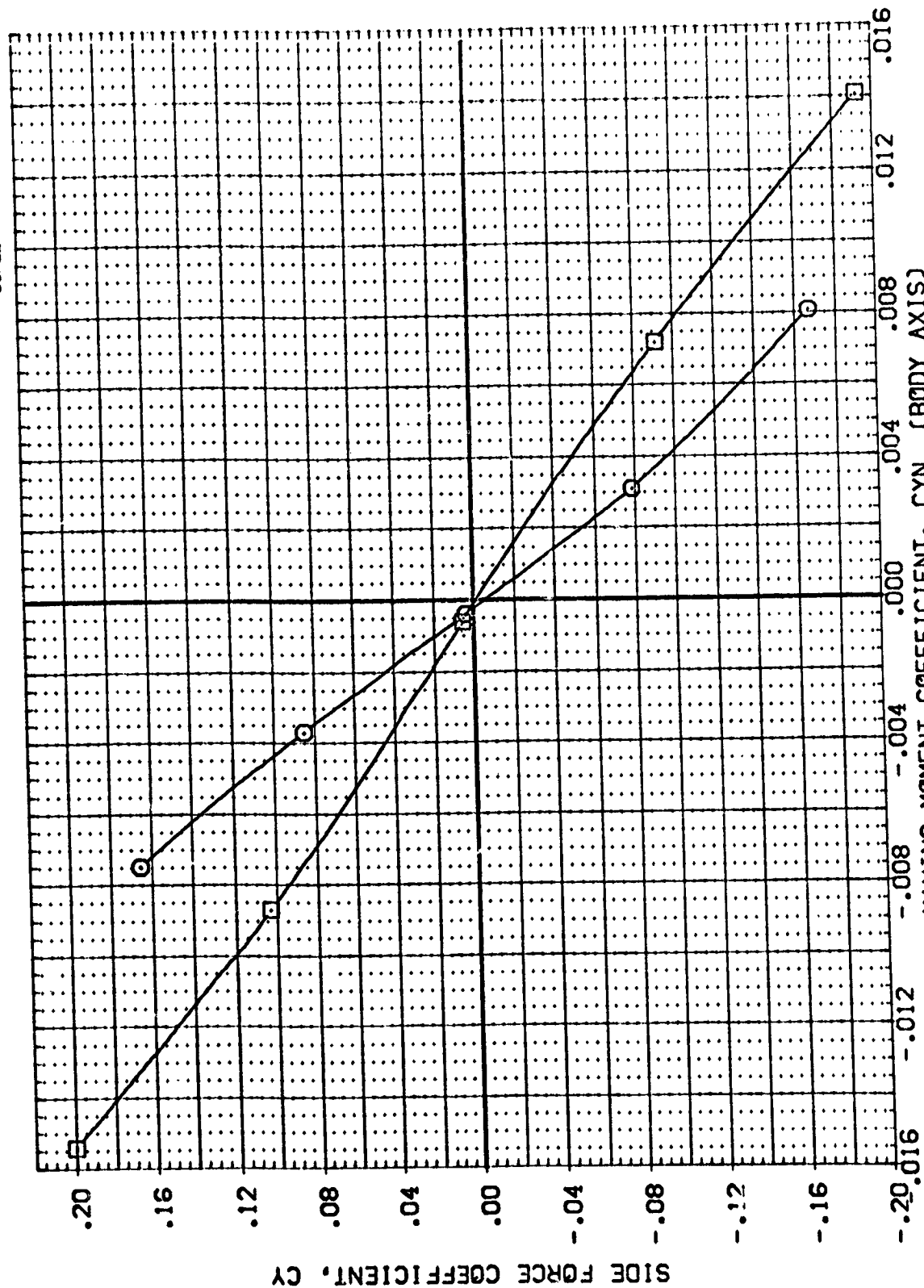


FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDFLR=40 DEGS., MN=0.598,0.903

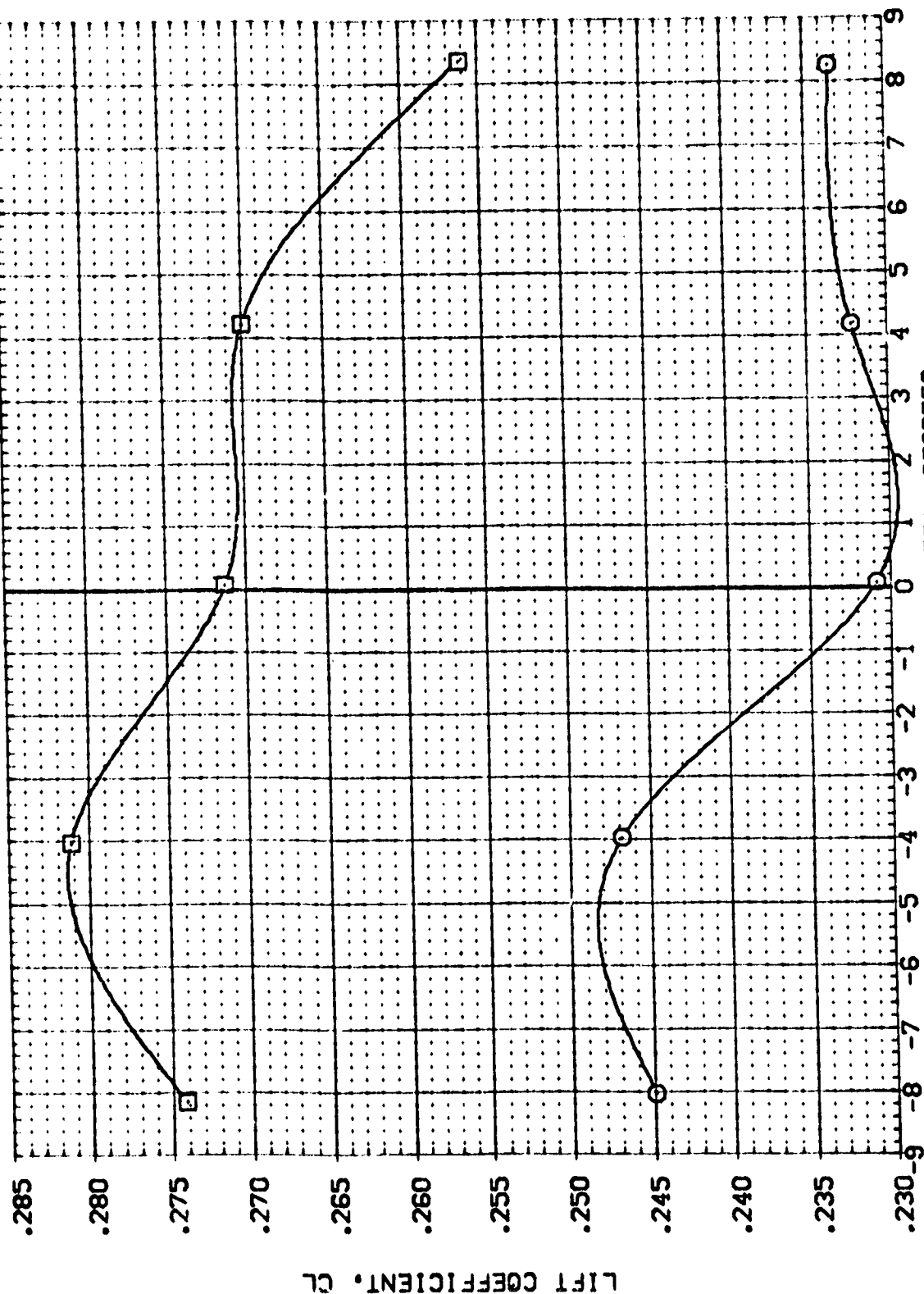
AMES 11-707 0A12 02A

(ABP035)

SYMBOL MACH ALPHA RUDDER
 O .598
 □ .303

PARAMETRIC VALUES
 5.000 ELEVON .000
 .000 RUDDLR 40.000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 39.849C
 BREF 39.849C
 XGRP 32.300C
 YGRP .000C
 ZGRP .000C
 SCALE .030C



SIDSLIP ANGLE, BETA, DEGREES

FIG.38 ORBITER LAT-DIR. DATA AT ALPHA=5 DEGS., RUDDLR=40 DEGS., MN=0.598, 0.903

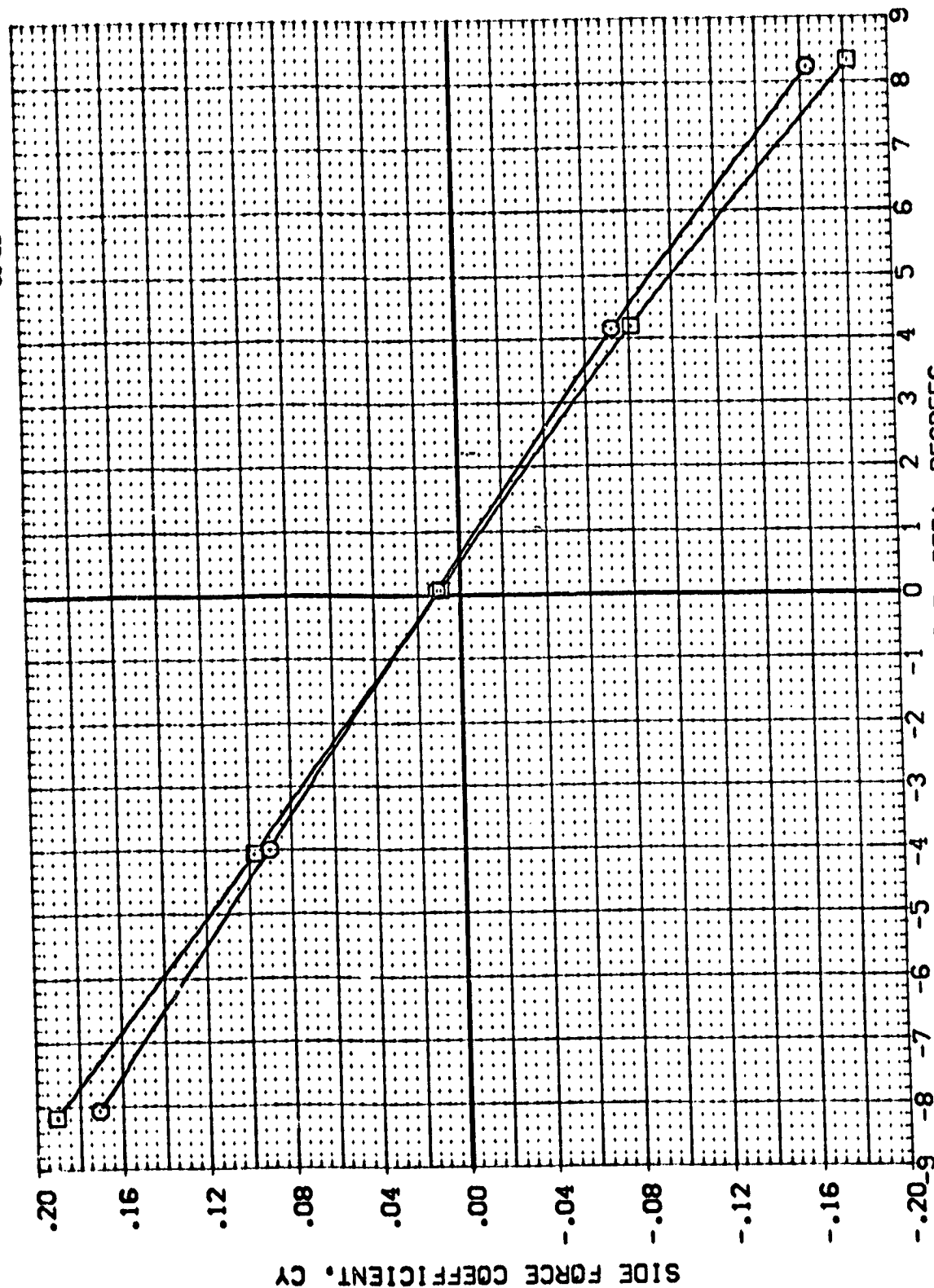
[RBP036]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 0 .599 .000
 1 .902 .000

PARAMETRIC VALUES
 10.000 ELEVON
 .000 RUDDLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 32.8490
 BREF 38.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300



SIDESLIP ANGLE, β , DEGREES

FIG.39 ORBITER LAT-DIR. DATA AT $\alpha = 10$ DEGS., $\alpha = 40$ DEGS., $MN = 0.599, 0.902$



(R8P036)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .599 .502
□ 10.000 .000
□ 40.000 40.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 38.3490
BREF 39.8490
KAP 32.3000
YAP .0000
ZAP .0000
SCALE .0000

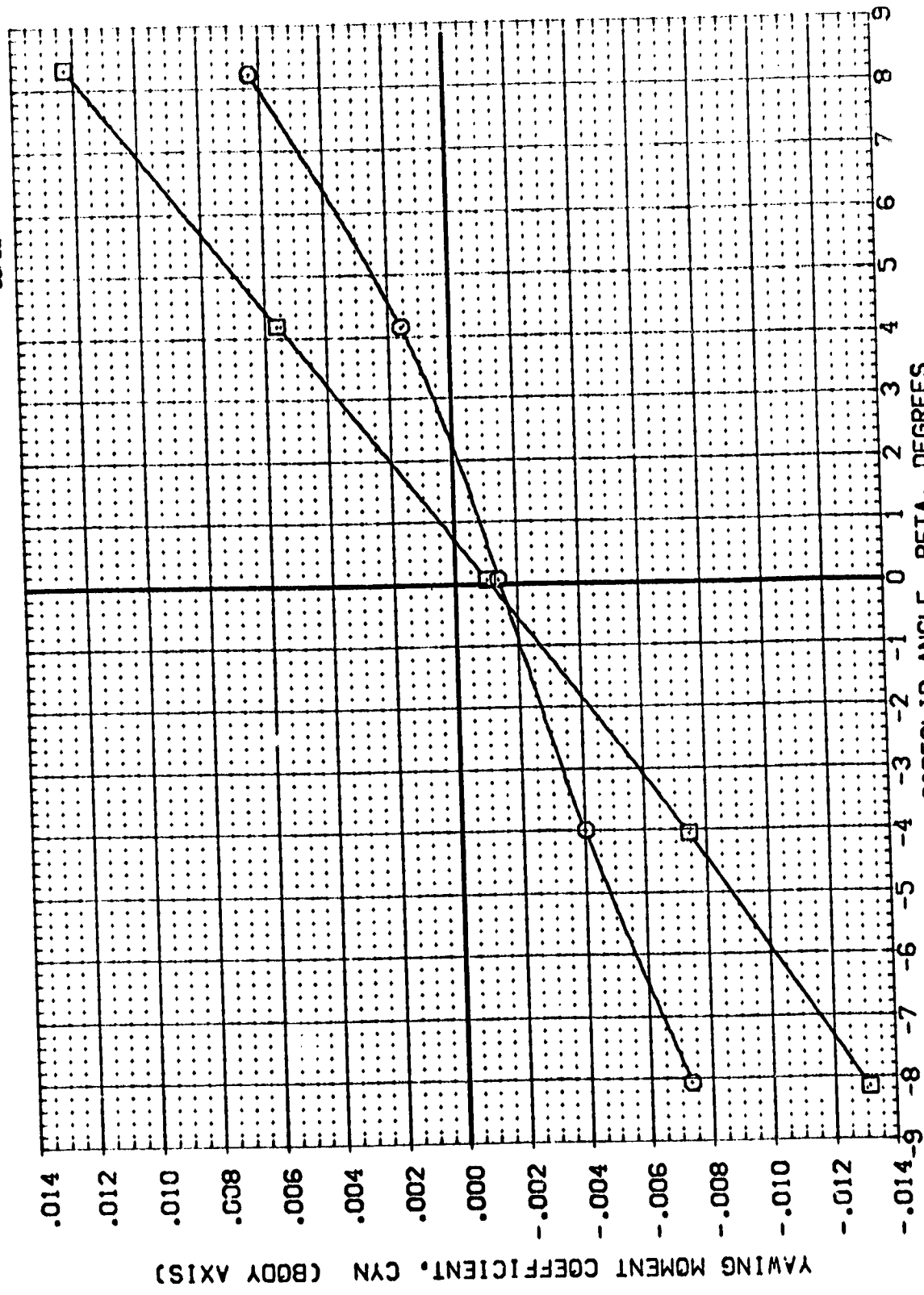


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., MN=0.599,0.902
RUDDFLR=40 DEGS.,

AMES 11-707 0A12 02A

| SIGNOL | WACH | PARAMETRIC VALUES |
|--------|------|-------------------|
| OL | .599 | 10.000 ELEVEN |
| | 000 | .000 ROOFER |
| | | 40.000 |
| | | .000 |

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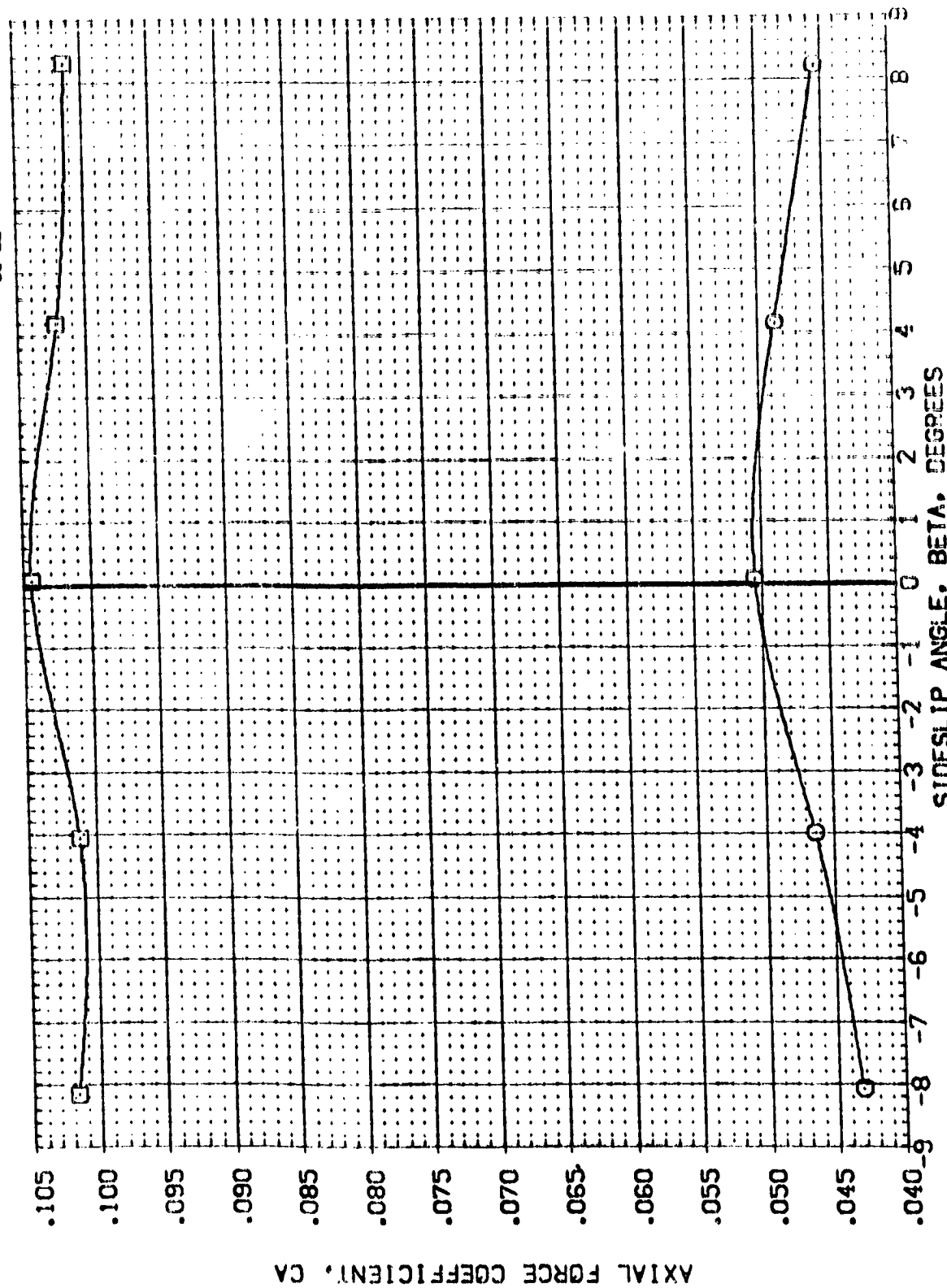


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDEL R=40 DEGS., $\gamma_N=0.599$, $\gamma_N=0.902$

AMES 11-707 0A12 02A

(R3P035)

SYMBOL MACH ALPHA RUDDER ELEVON RUOFLR .000 .000 40.000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 28.6390 IN.
 BREF 38.6390 IN.
 XREF 32.5000 IN.
 YREF .0000 IN.
 ZREF .0000 IN.
 SCALE 1.0000

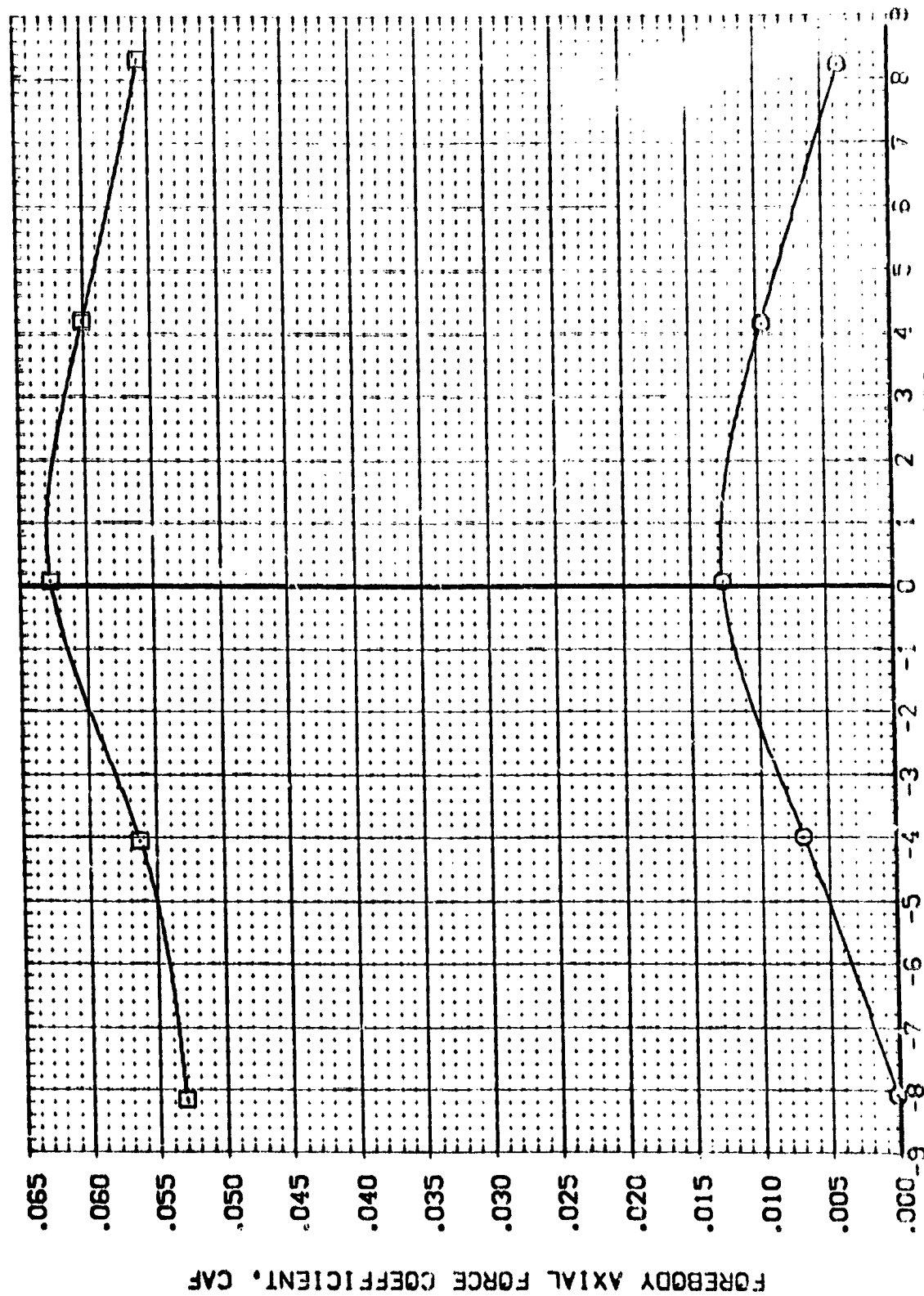


FIG.39 ORBITER LAT-SIP. DATA AT ALPHA=10 DEGS., RUOFLR=40 DEGS., $M=0.589$, 0.902
 Sideslip Angle, Beta, Degrees
 Page 319

(439036)

AMES 11-707 GA12

MA

| SYMBOL | MACH | ALPHA | PARAMETER | SCALE |
|--------|------|--------|-----------|--------|
| □ | .589 | 10.000 | | .000 |
| ○ | .902 | .000 | | 40.000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| YREF | 2.4270 |
| XREF | 36.8450 |
| ZREF | 36.8450 |
| YPRP | 30.0000 |
| XPRP | 10.0000 |
| ZPRP | 10.0000 |
| SCALE | 1.3000 |

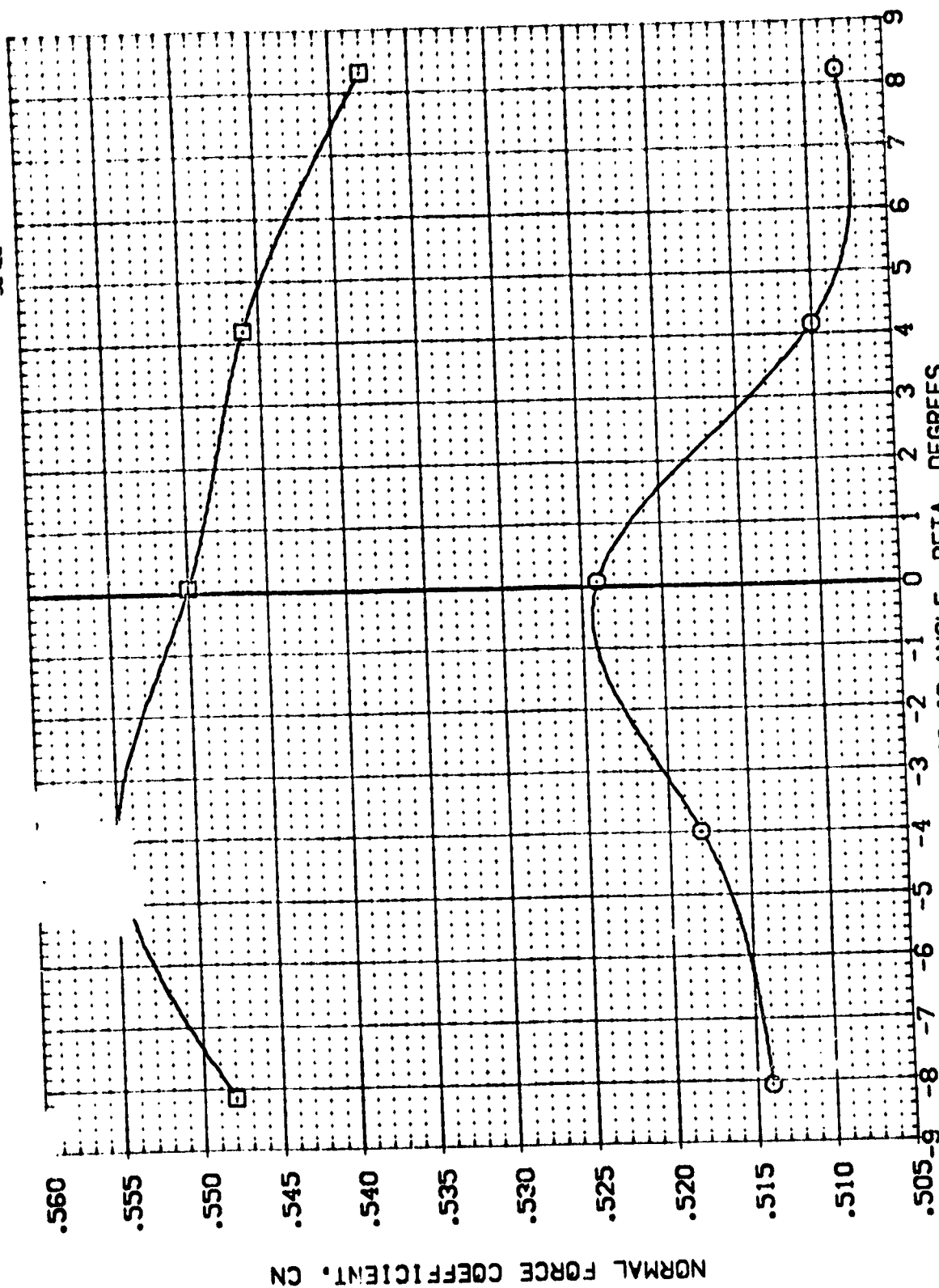


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDFLR=40 DEGS., MN=0.599,0.902

(RBP036)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUOFLR .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8450
BREF 39.8450
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

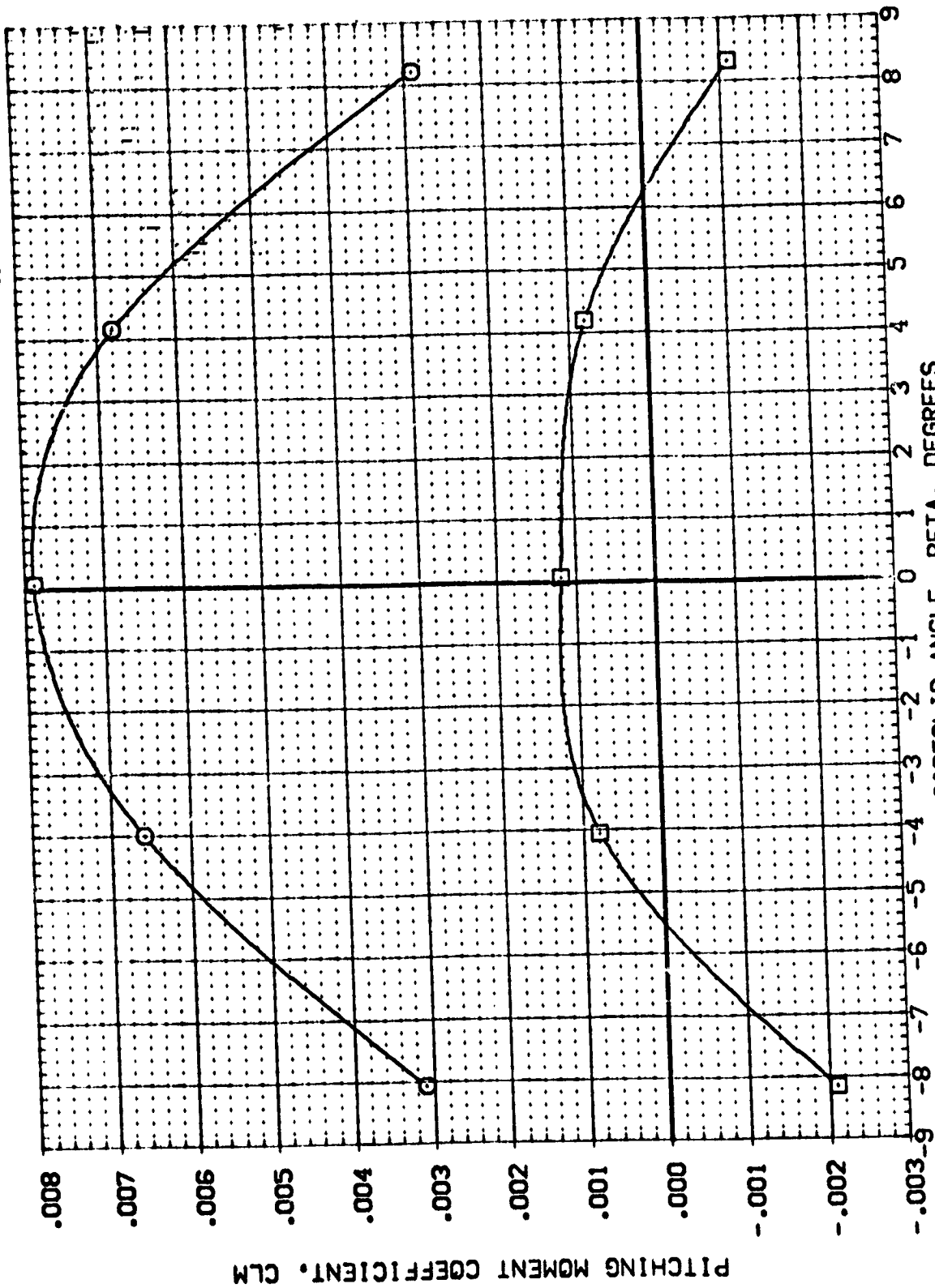


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUOFLR=40 DEGS., MN=0.599,0.902

(RBP036)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES J00 J00.000 ELEVON RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8480
BREF 39.8480
XMRP 32.3000
YMRP 0.0000
ZMRP 0.0000
SCALE 0.0000

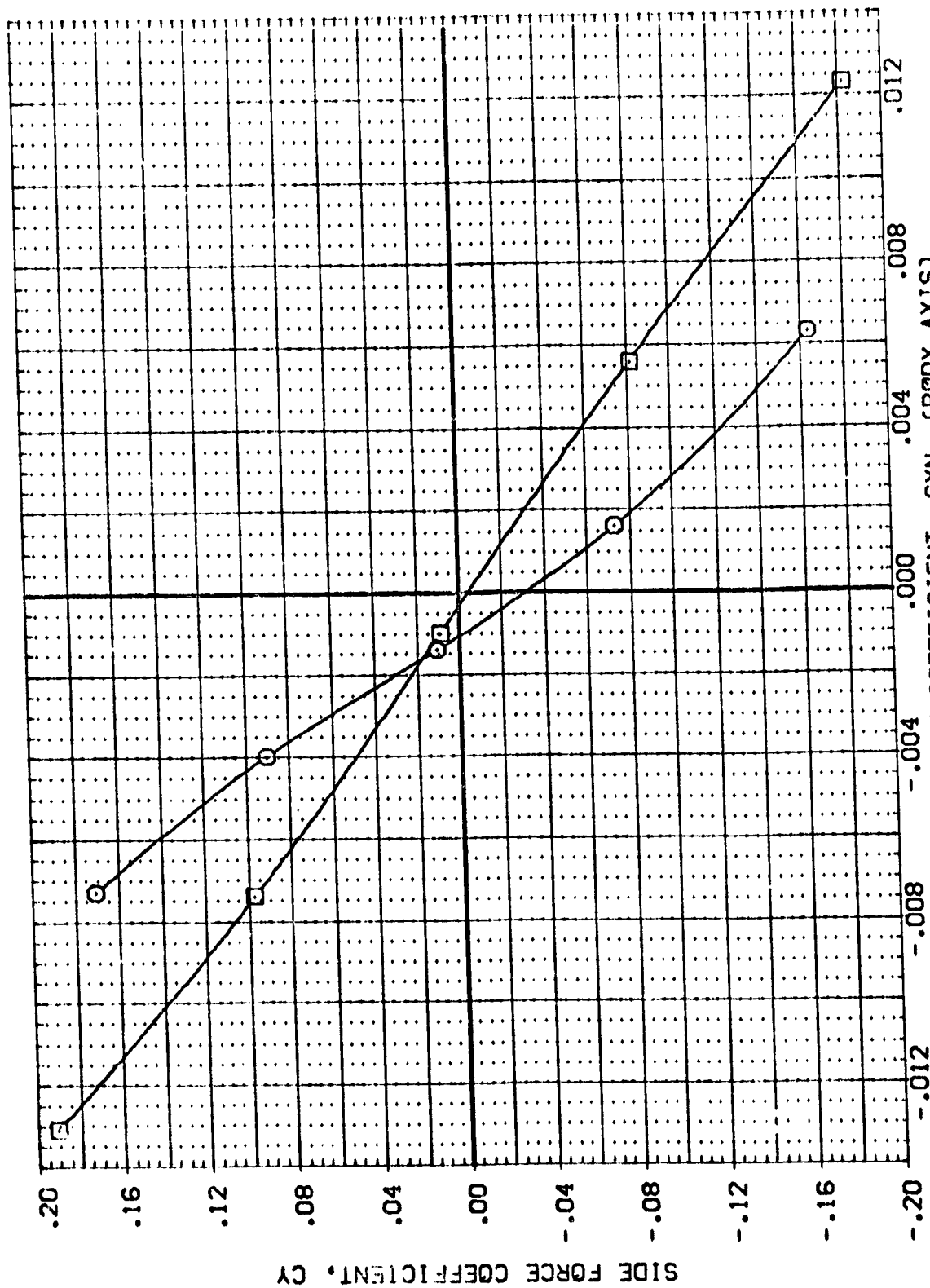


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUOFLR=40 DEGS., MN=0.599,0.902
YAWING MOMENT COEFFICIENT, C_{YN} (BODY AXIS)
PAGE 322



(ABP036)

AMES 11-707 0A12 02A

| | | | | |
|--------|------|-------------------|--------|--------|
| SYMBOL | MACH | PARAMETRIC VALUES | | |
| | | ALPHA | 10.000 | ELEVON |
| ○ | .599 | RUDDER | .000 | 40.000 |
| □ | .902 | | | |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SQ.FT. |
| LREF | 39.8490 | IN. |
| BREF | 39.8490 | IN. |
| XGRP | 32.3000 | IN. |
| YGRP | .0000 | IN. |
| ZGRP | .0000 | IN. |
| SCALE | .0300 | SCALE |

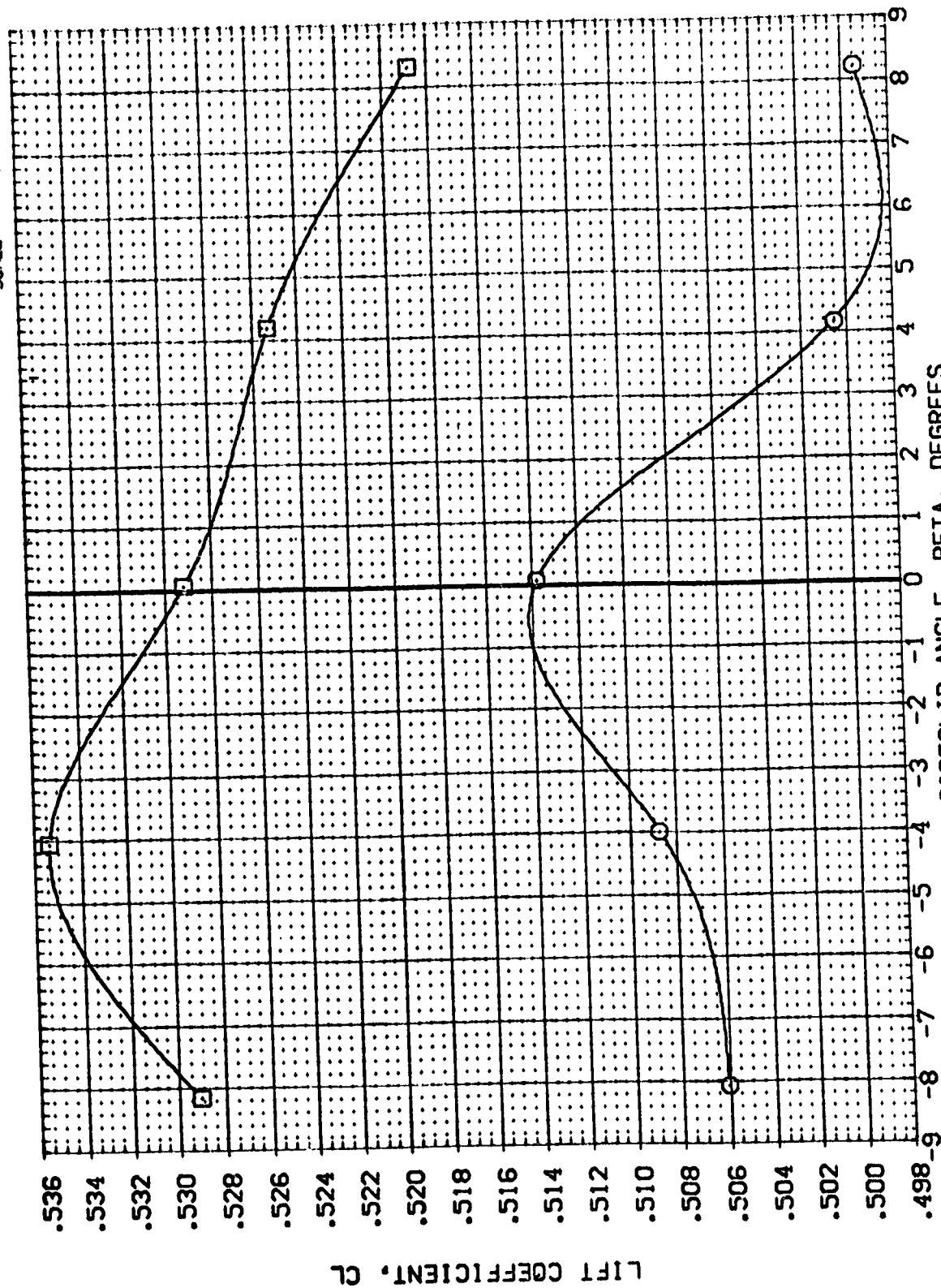


FIG.39 ORBITER LAT-DIR. DATA AT ALPHA=10 DEGS., RUDDFLR=40 DEGS., MN=0.599,0.902

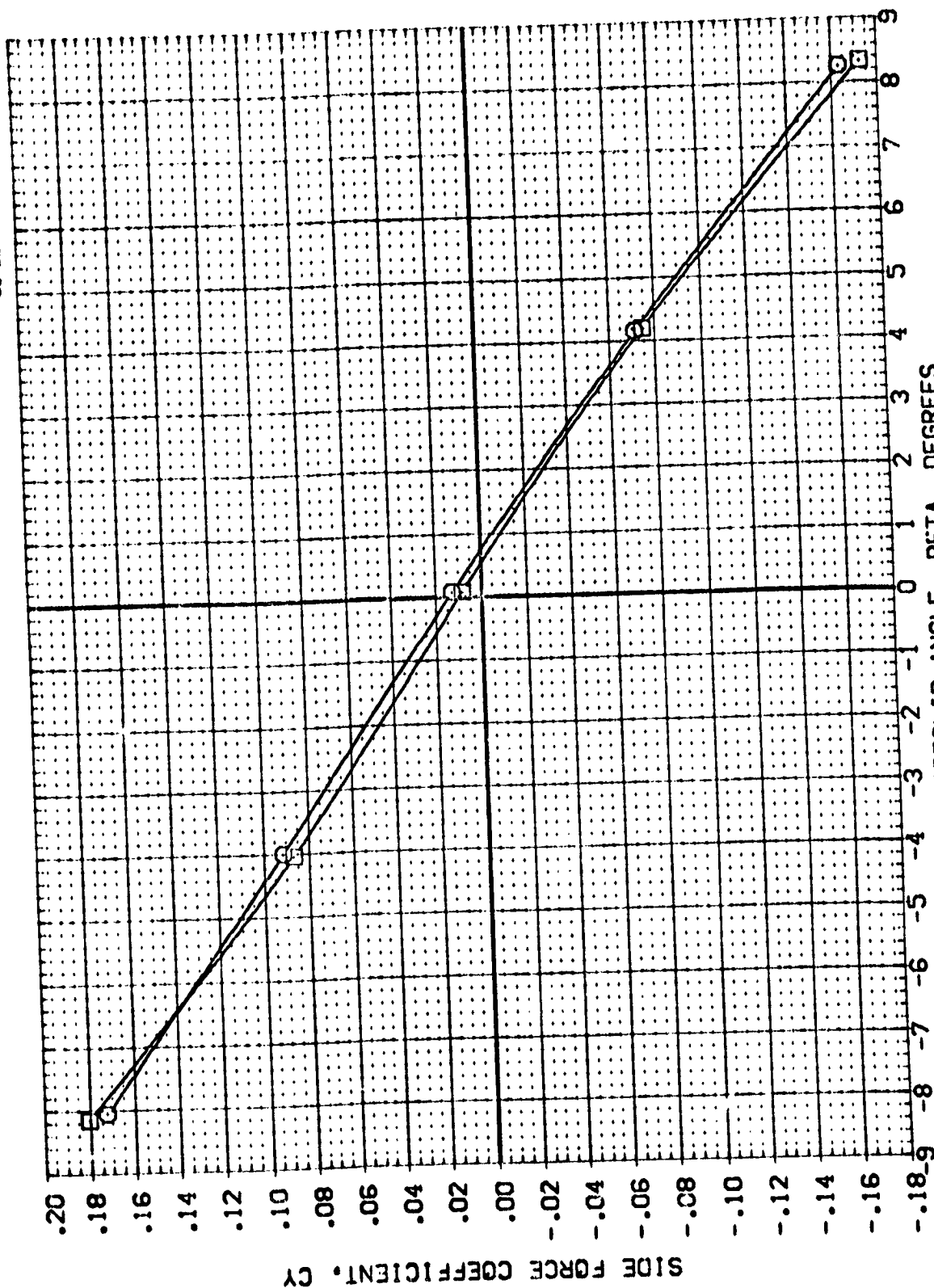
(RBPC37)

AMES 11-707 0A12 02A

| SYMBOL | | PARAMETRIC VALUES | |
|--------|------|-------------------|--------|
| MACH | .596 | ALPHA | .000 |
| ELEVON | .000 | RUDFLR | 40.000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| SREF | 2.4210 |
| LREF | 38.8490 |
| BREF | 38.8490 |
| YREF | 32.3000 |
| ZREF | .0000 |
| SCALE | .0000 |



SIDESLIP ANGLE, BETA, DEGREES

FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., MN=0.596, 0.899
RUDFLR=40 DEGS.,

(RBP037)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
☐ .596 .899
 PARAMETRIC VALUES
 15.000 ELEVON .000
 .000 RUOFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.849C
 BREF 39.849C
 XPRP 32.300C
 YPRP .000C
 ZPRP .000C
 SCALE .030C

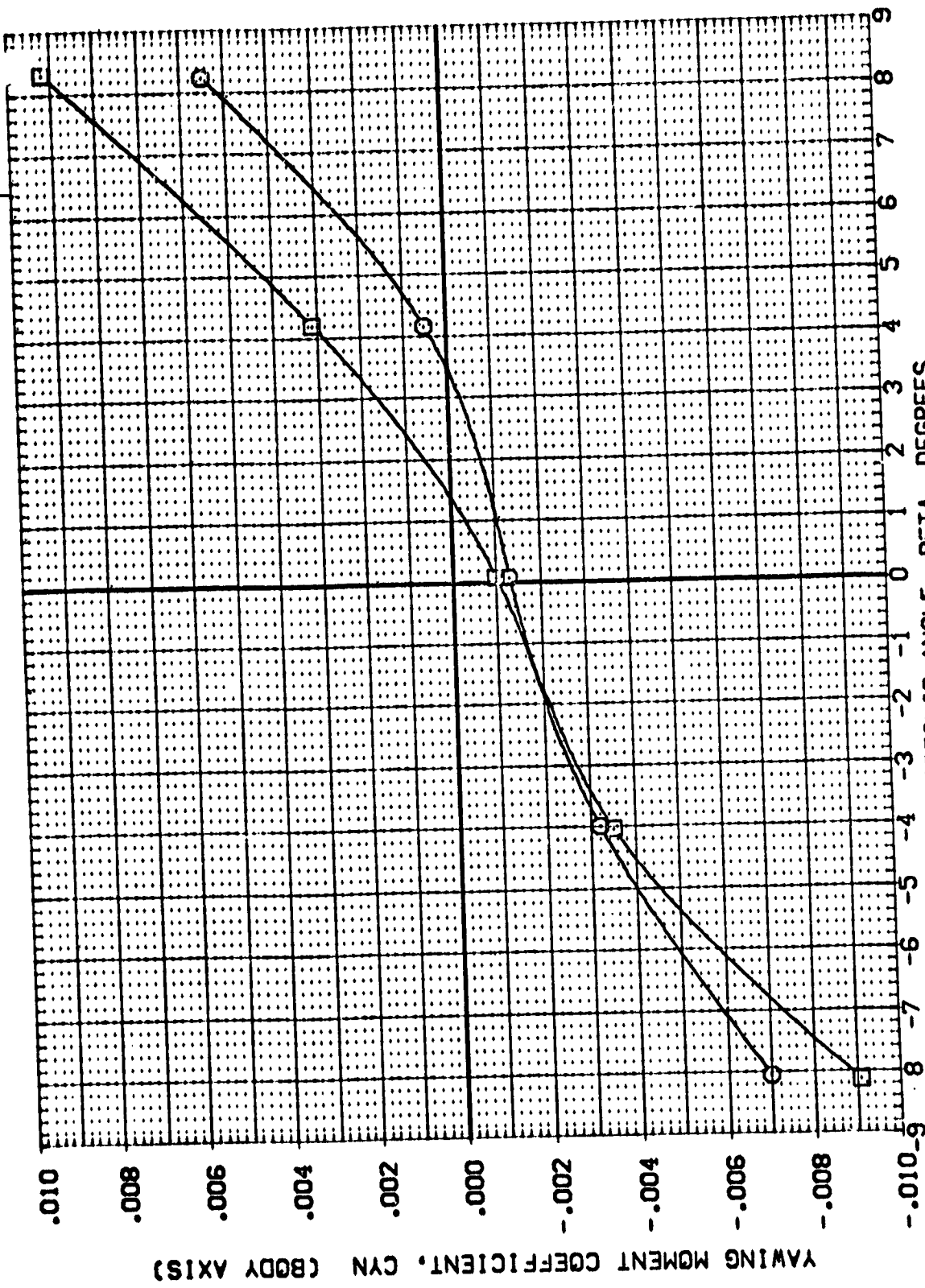


FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUOFLR=40 DEGS., MN=0.596, 0.899

(RBP037)

AMES 11-707 CA12 C2A

SYMBOL MACH ALPHA RUDDER
□ .596 .899
□ 15.000 .000
□ ELEVON RUFLR 40.000

REFERENCE INFORMATION
SRF 2.4210 SQ.FT.
LREF 39.8190
BREF 39.8190
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE 11.22 SCALE

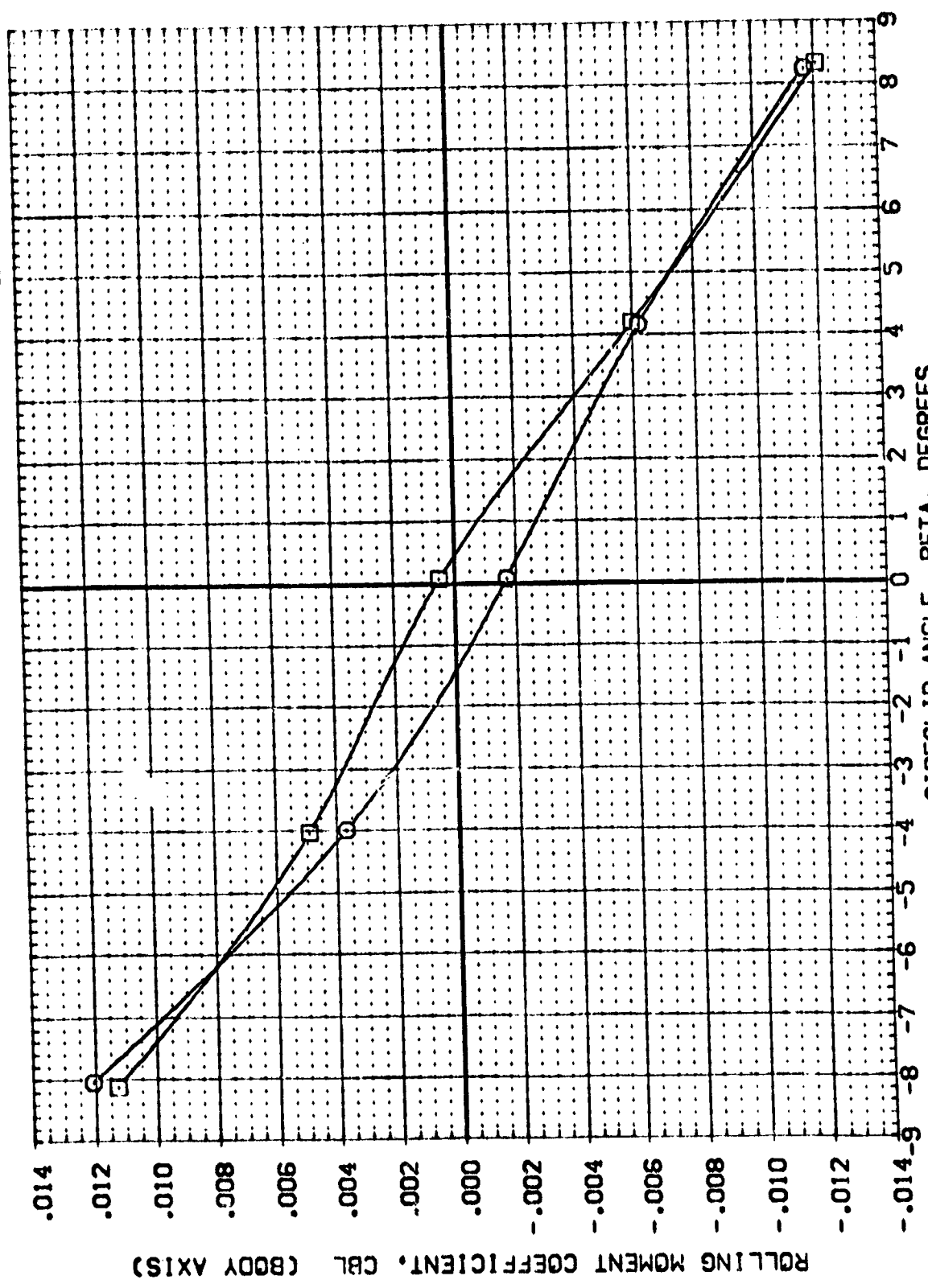


FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDFLR=40 DEGS., MN=0.596, 0.899

(RBP037)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .596 .899
□ 15.000 .000
□ ELEVON RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

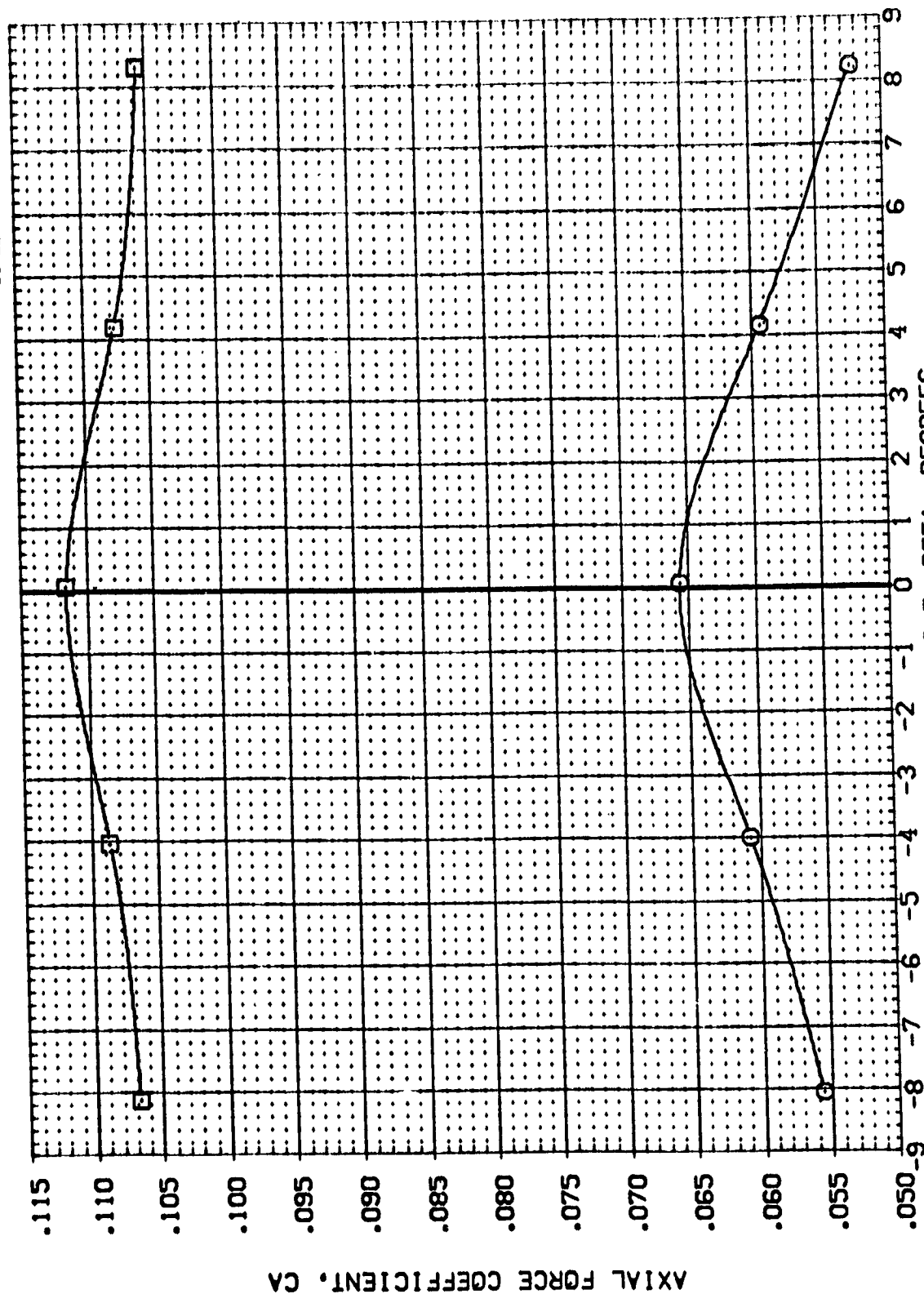


FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUOFLR=40 DEGS., MN=0.596, 0.899

III

AMES 11-707 0A12 02A

(RBP037)

SYMBOL MACH ALPHA RUDDER
 O .595 .899
 □ 15.000 .000
 ELEVON RUOFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0300

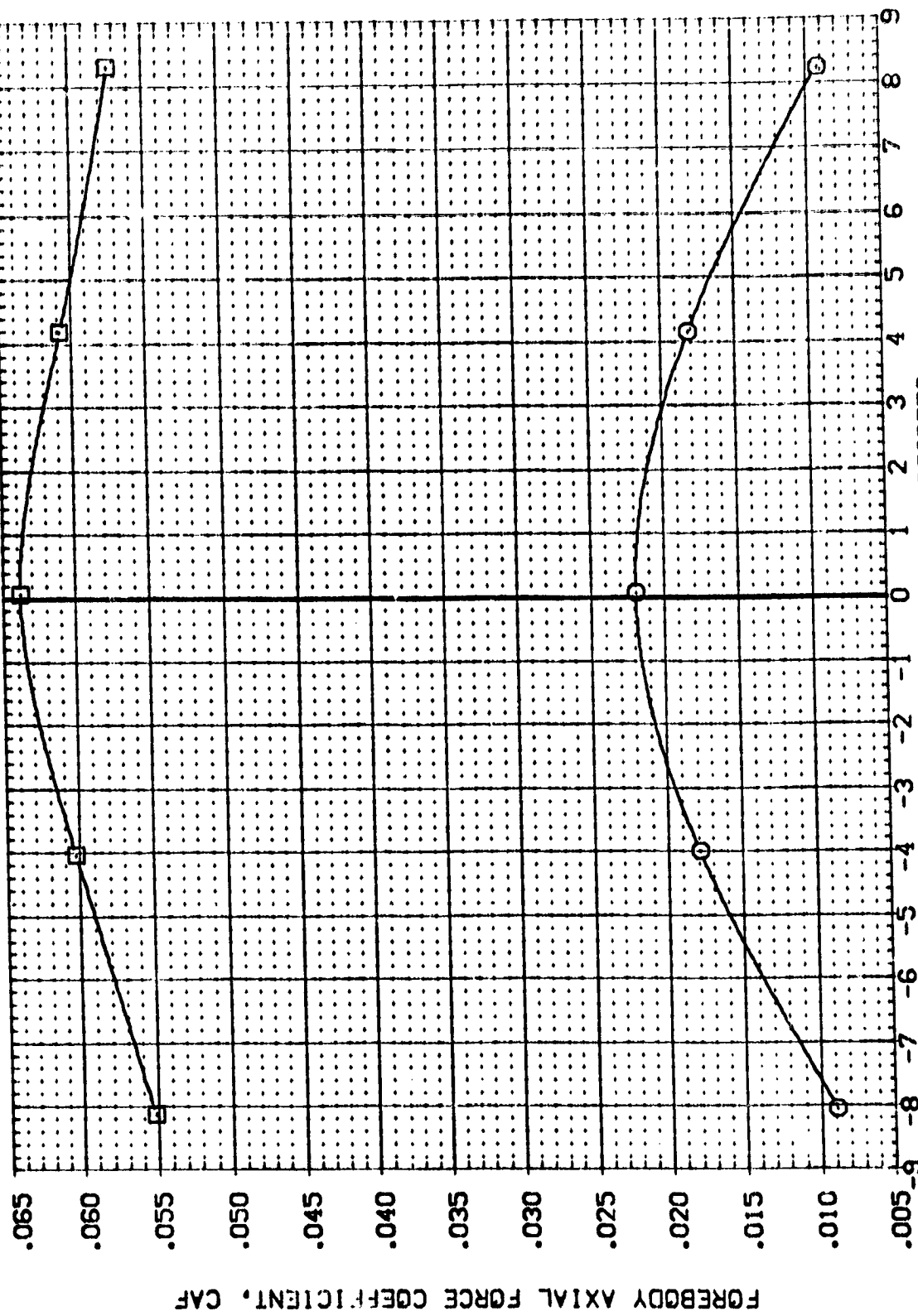


FIG.40 ORBITER LAT-OIR. DATA AT ALPHA=15 DEGS., RUOFLR=40 DEGS., MN=0.595, 0.899

(RBP037)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .596 .899
□ 15.000 .000
ELEVON 40.000
P DFLR

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
WREF 32.3000 IN.
VREF .0000 IN.
ZREF .0000 IN.
SCALE .0000

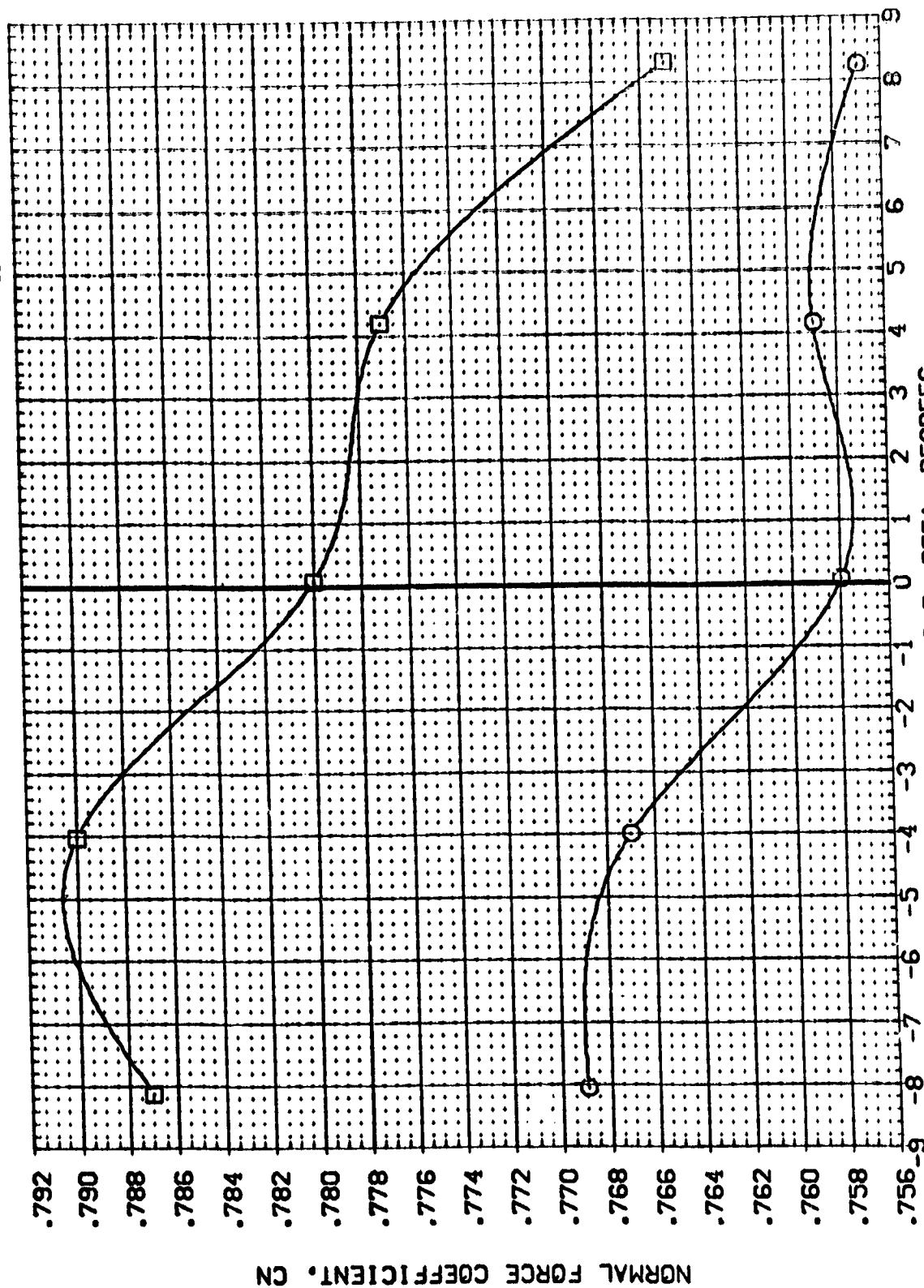


FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDFLR=40 DEGS., YN=0.596, 0.899

(RB-037)

| SYMBOL | WAVELENGTH | ALPHA | ROTOR | ELEVATION | PARAMETRIC VALUES |
|--------|------------|-------|-------|-----------|-------------------|
| Q | 1.596 | | | 15.000 | .000 |
| Q | 1.899 | | | .000 | 40.000 |

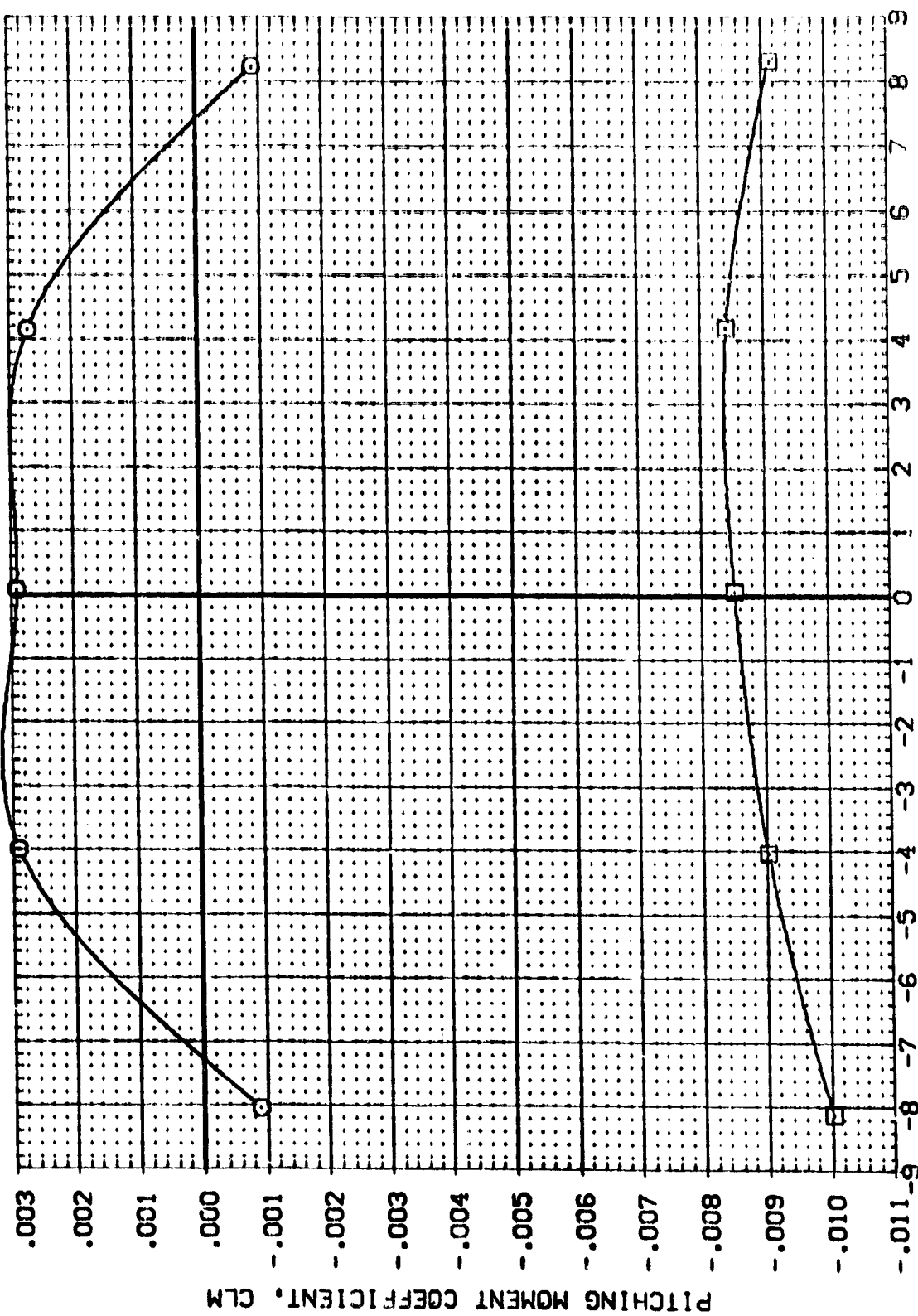
[illegible]

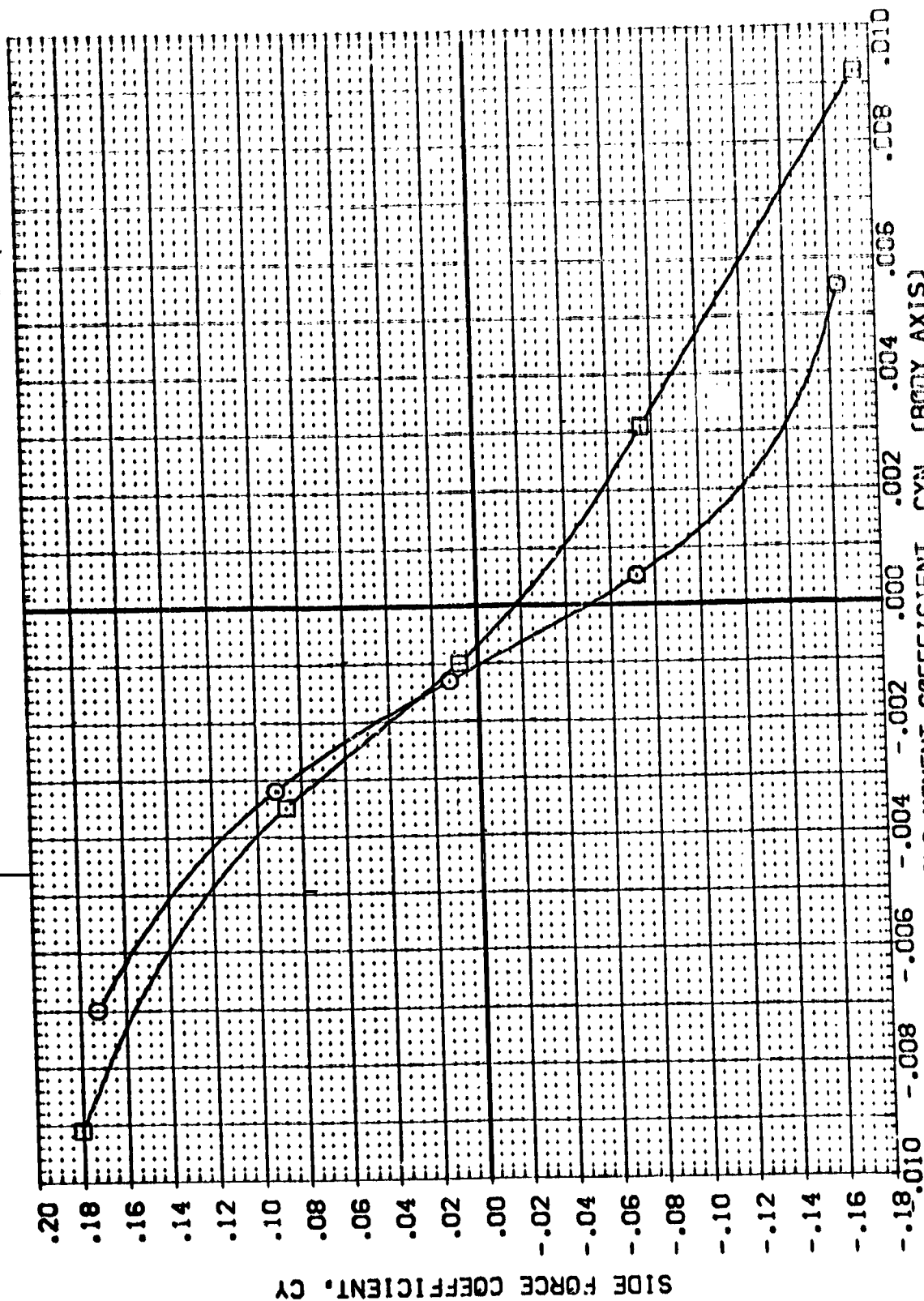
FIG. 40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUOFLR=40 DEGS., $\gamma_A=0.536$, 0.899

[RBP037]

AMES 11-707 0A12 02A

SYMBOL MAG. ALPHA RUDDER
 0 .596 .899
 1 15.000 .003 40.000
 2 15.000 .003 40.000
 3 15.000 .003 40.000
 4 15.000 .003 40.000
 5 15.000 .003 40.000
 6 15.000 .003 40.000
 7 15.000 .003 40.000
 8 15.000 .003 40.000
 9 15.000 .003 40.000
 10 15.000 .003 40.000
 11 15.000 .003 40.000
 12 15.000 .003 40.000
 13 15.000 .003 40.000
 14 15.000 .003 40.000
 15 15.000 .003 40.000
 16 15.000 .003 40.000
 17 15.000 .003 40.000
 18 15.000 .003 40.000
 19 15.000 .003 40.000
 20 15.000 .003 40.000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.6450
 BREF 38.6450
 XREF 30.3000
 YREF 30.3000
 ZREF 30.3000
 SCALE 1.000



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

FIG.40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDDLR=40 DEGS., YN=0.596, 0.899

AYES 11-707 CA:2

| SYMBOL | WAVELENGTH | ALPHA | DIFFER | RELATIVE | ELEVATION | PARAMETRIC VALUES |
|--------|------------|-------|--------|----------|-----------|-------------------|
| 10 | 5.95 | | | | 15.000 | .000 |
| | 8.00 | | | | .000 | 40.000 |

100-443886-100

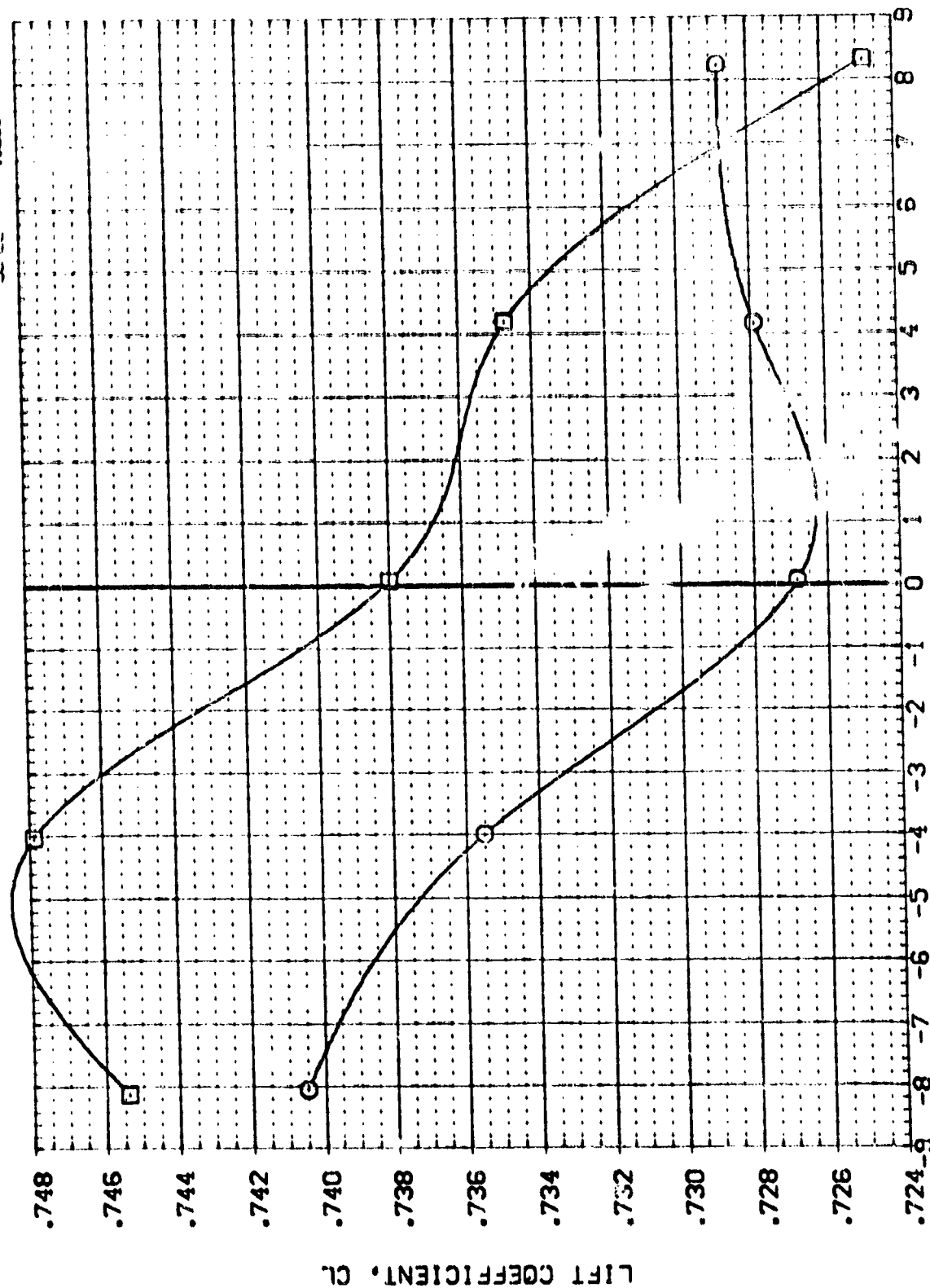


FIG. 40 ORBITER LAT-DIR. DATA AT ALPHA=15 DEGS., RUDFLR=40 DEGS., $\Psi N=0.325, 0.899$

(CBP038)

AMES 11-707 0A12 02A

| | | | |
|--------|------|-------------------|---------------|
| SYMBOL | MACH | PARAMETRIC VALUES | |
| | .598 | 20.000 | ELEVON .000 |
| □ | .899 | .000 | RUDFLR 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SQ.FT. |
| LRP | 39.8450 | IN. |
| SRP | 39.8450 | IN. |
| MRP | 32.3000 | IN. |
| MRP | .0000 | IN. |
| MRP | .0000 | IN. |
| SCALE | .0300 | SCALE |

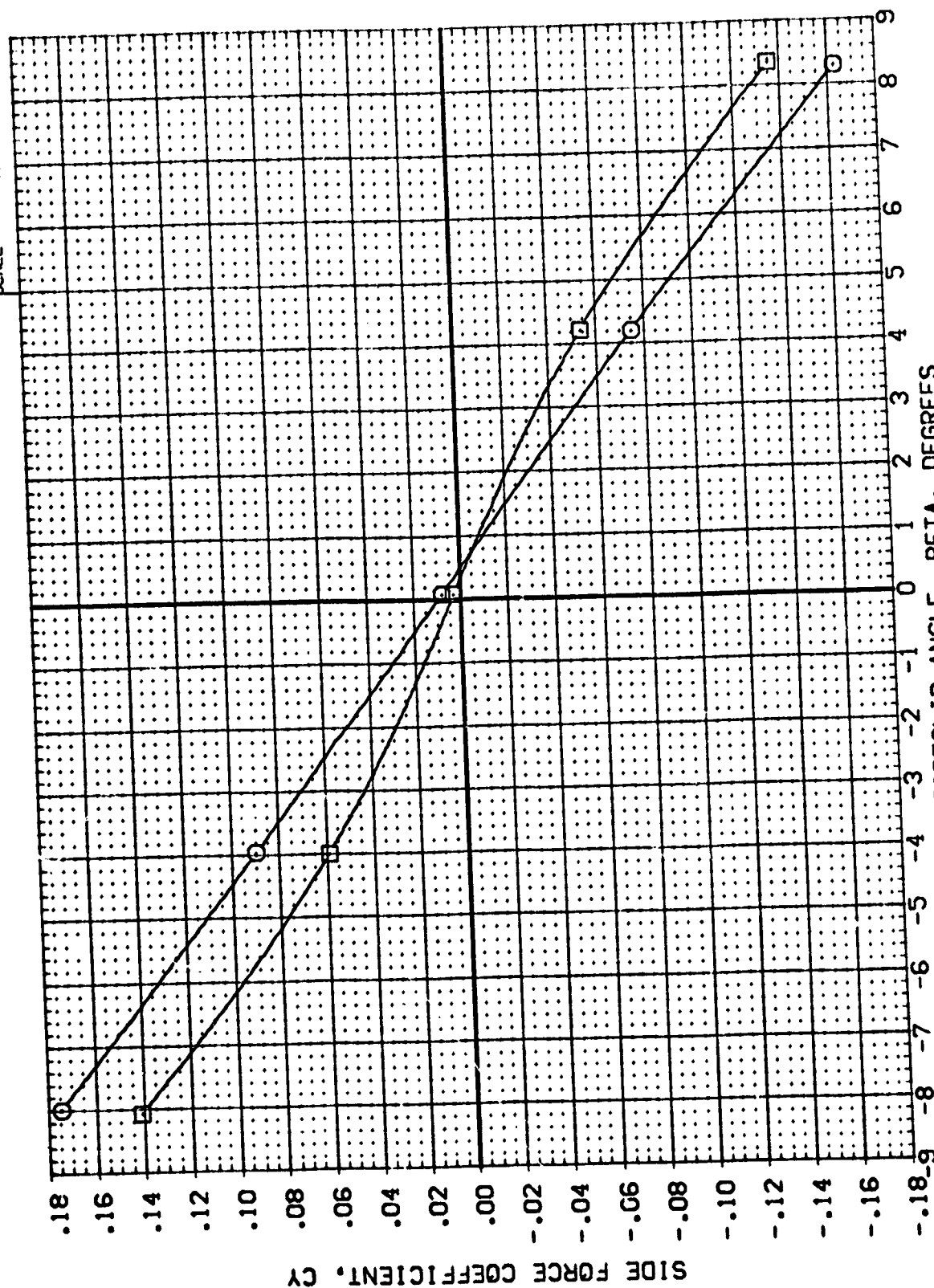


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899

(CBP038)

AMES 11-707 0A12 02A

SYMBOL M 3 ALPHA RUDDER 20.000 ELEVON RUFLR 40.000
0 1 .899

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
YMRP 32.3000
ZMRP 0.0000
SCALE .0300

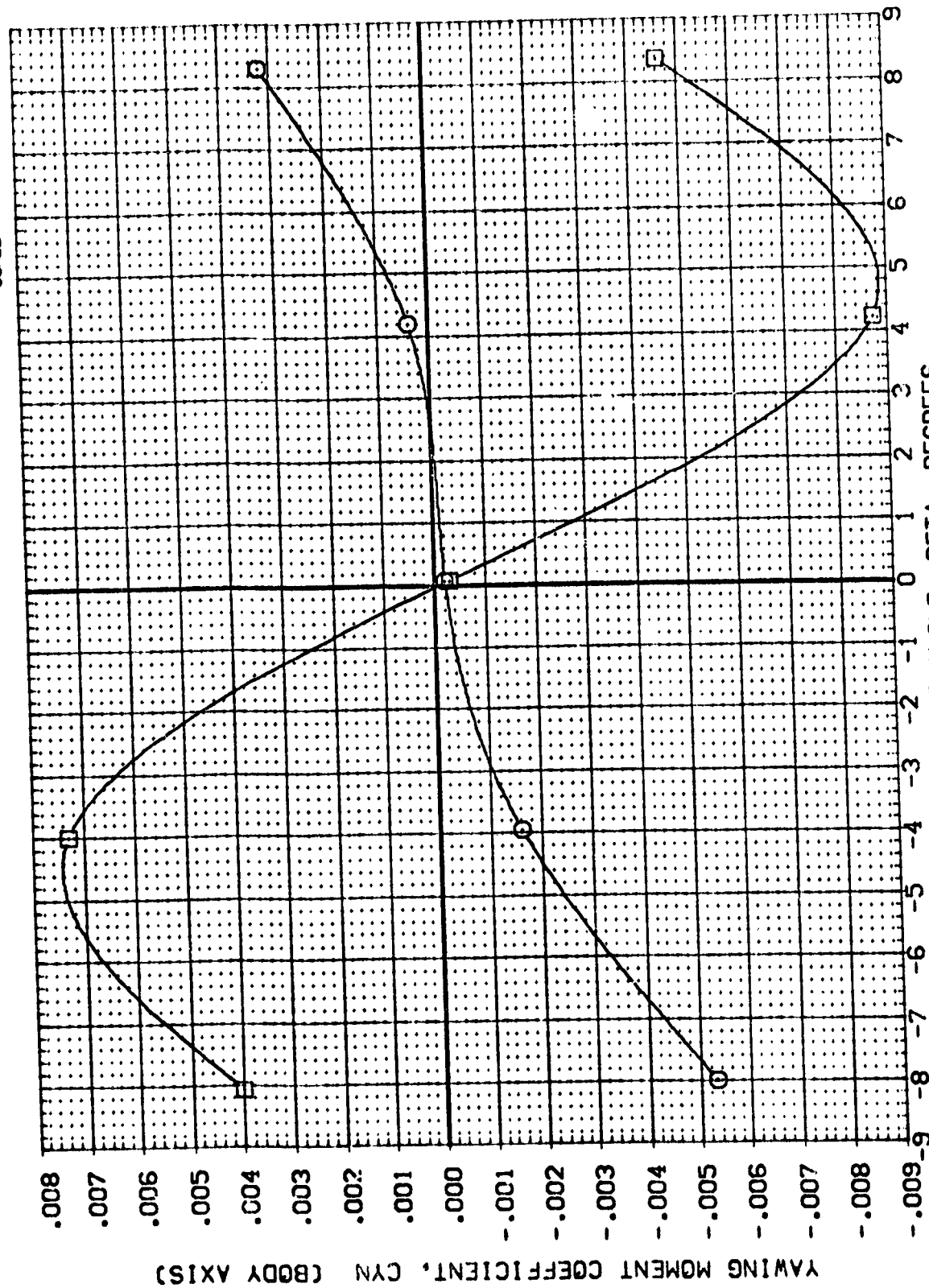


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDDLR=40 DEGS., MN=0.598, 0.899
PAGE 334

(CBP038)

AMES 11-707 0A12 02A

| | | | |
|--------|------|-------------------|--------|
| SYMBOL | MACH | PARAMETRIC VALUES | |
| | | ALPHA | ELEVON |
| □ | .598 | 20.000 | .000 |
| □ | .899 | .000 | 40.000 |
| | | RUDFLR | |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SO.FT. |
| LREF | 29.8490 | IN. |
| BREF | 32.8490 | IN. |
| XPRP | 32.3000 | IN. |
| YPRP | .0000 | IN. |
| ZPRP | .0000 | IN. |
| SCALE | .0300 | SCALE |

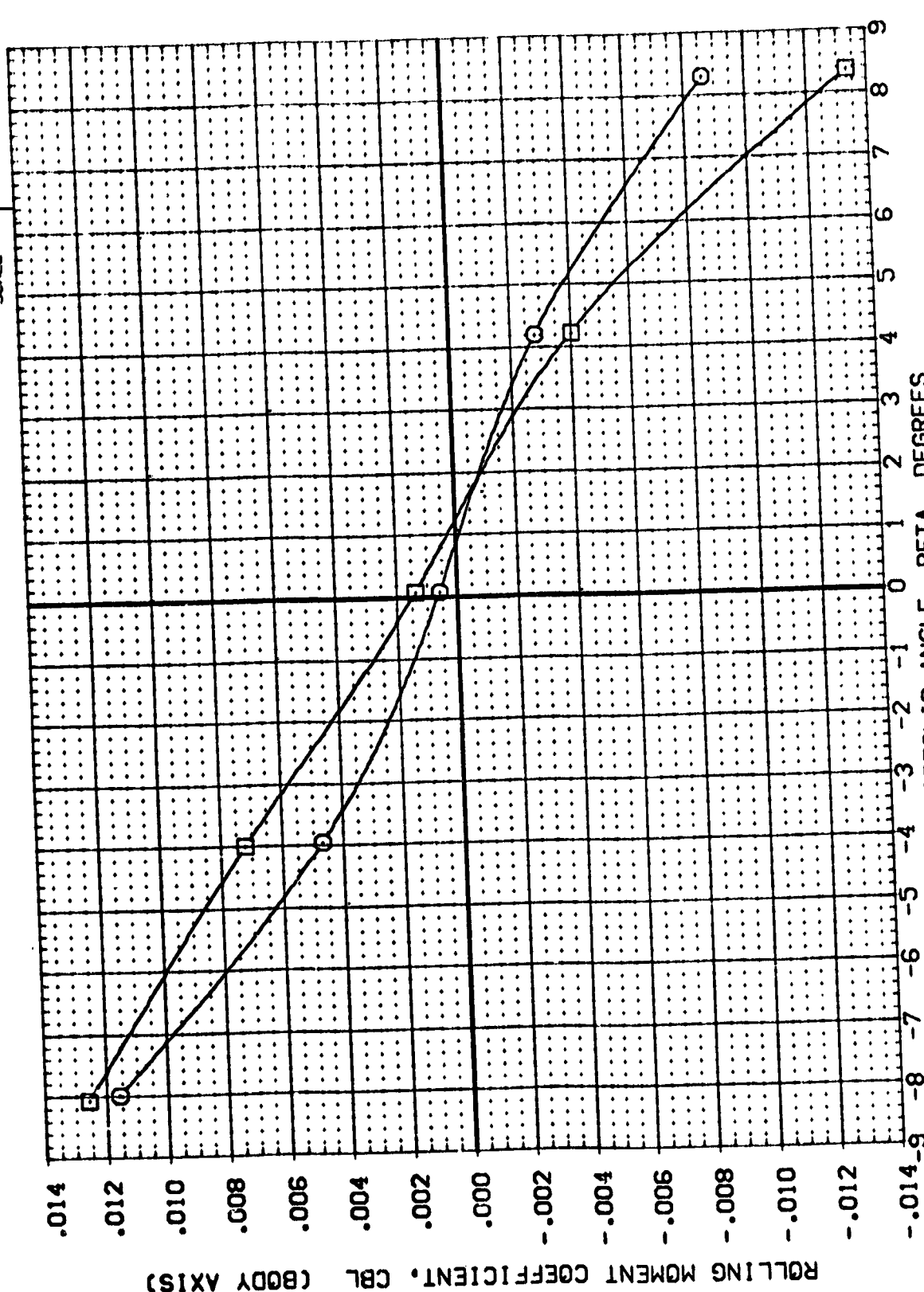


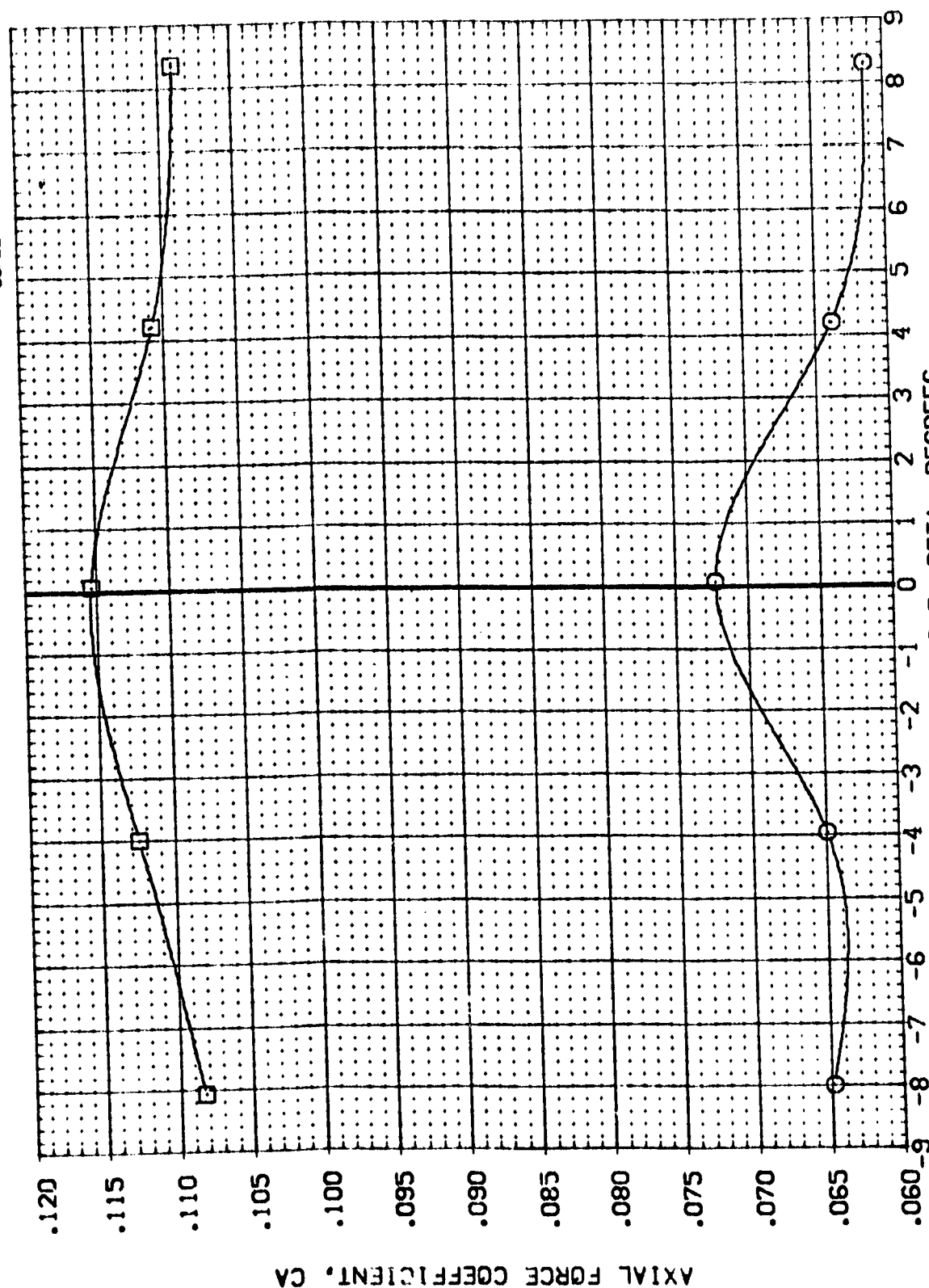
FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 335

[CBP038]

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 ○ .598 .000 .000 20.000 ELEVON .000
 □ .899 .000 .000 40.000 RUOFLR

REFERENCE INFORMATION
 SREF 2.4210 SQ. FT.
 LREF 39.8493 IN.
 BREF 39.8493 IN.
 XMRP 32.3000 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 1000



SIDSLIP ANGLE, BETA, DEGREES

FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUOFLR=40 DEGS., MN=0.598, 0.899

AMES 11-707 0A12 02A

(CBP038)

| | | | | | |
|--------|------|-------|--------|--------|--------|
| SYMBOL | MACH | ALPHA | 20.000 | ELEVON | .000 |
| ○ □ | .598 | RUDER | .000 | RUDFLR | 40.000 |

| | |
|-----------------------|---------|
| REFERENCE INFORMATION | |
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| YPRP | 17.3000 |
| ZPRP | .0000 |
| ZPRP | .0000 |
| SCALE | .0500 |

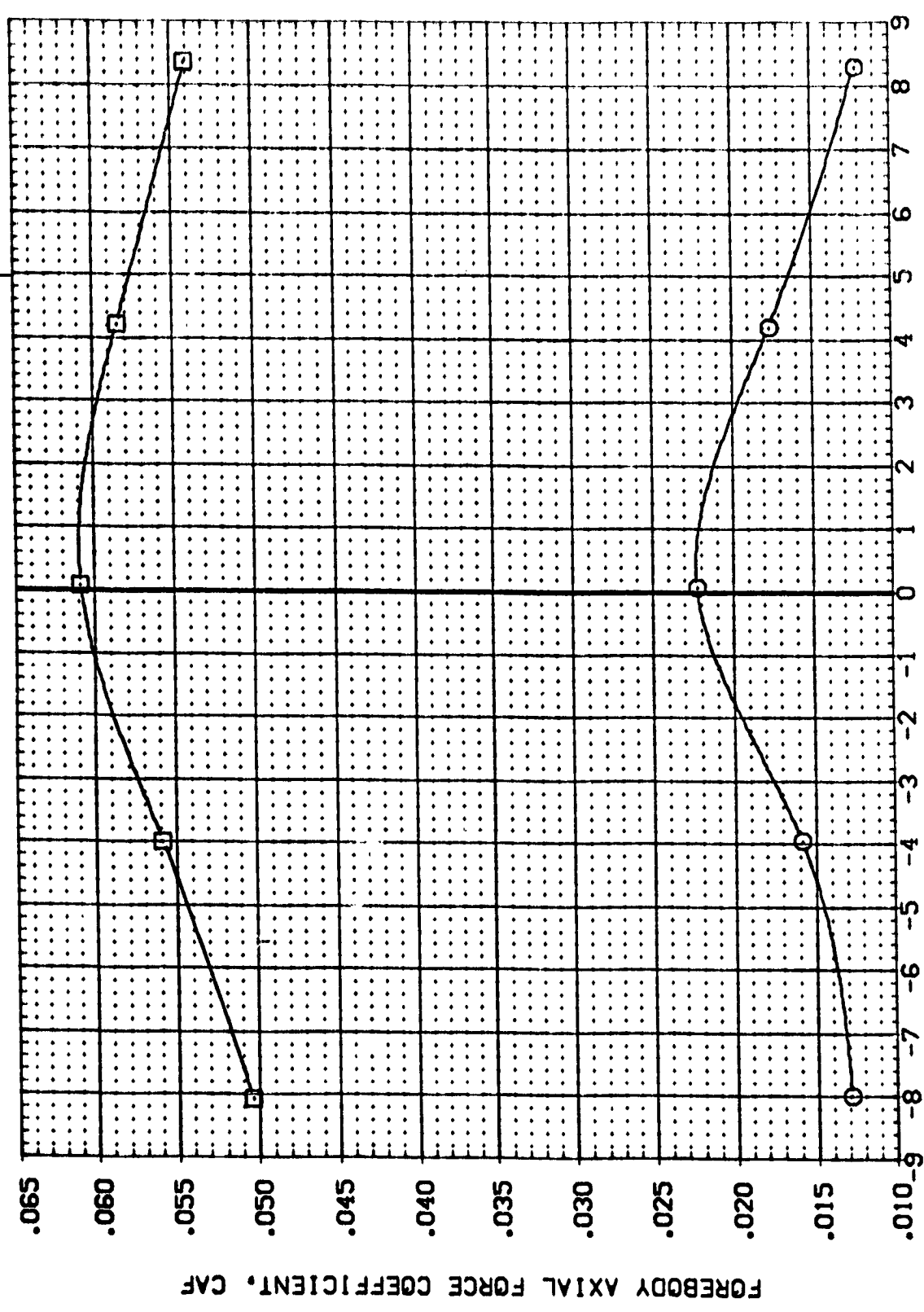


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., MN=0.598,0.899
 SIDESLIP ANGLE, BETA, DEGREES
 RUDFLR=40 DEGS.,

(CBP038)

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES
○ .598 .899 20.000 .000 ELEVON
□ .000 .000 40.000 RUDFLR

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.6490 IN.
BREF 39.6490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

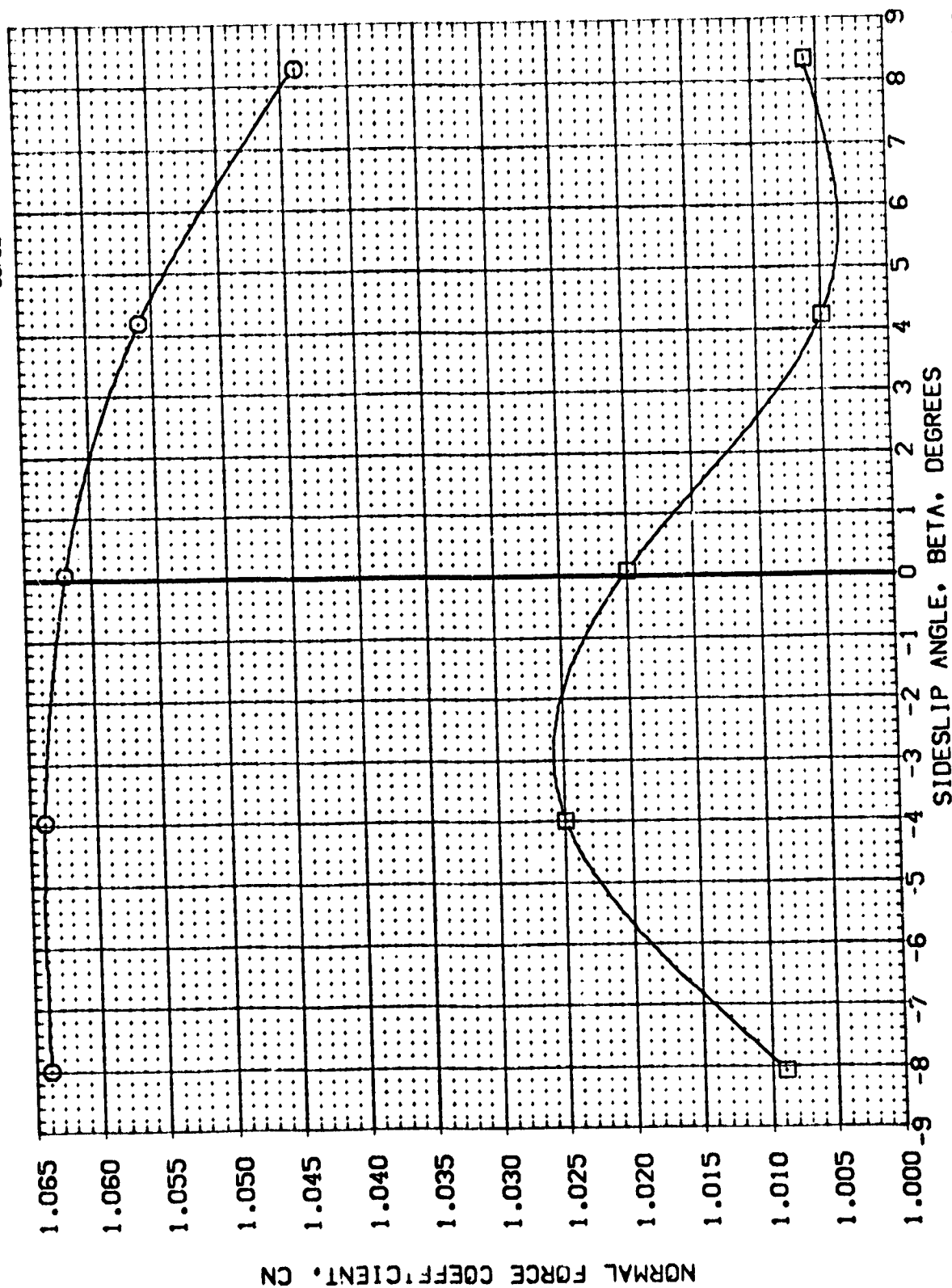


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899

(CBP038)

AMES 11-707 0A12 02A

| SYMBOL | | MACH | PARAMETRIC VALUES | |
|--------|---|-------|-------------------|--------|
| ○ | □ | | 20.000 | 10.000 |
| | | ALPHA | ELEVON | RUDFLR |
| ○ | □ | .598 | .000 | .000 |
| ○ | □ | .699 | .000 | .000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SQ.FT. |
| LREF | 39.8490 | IN. |
| BREF | 39.8490 | IN. |
| XMCP | 32.3000 | IN. |
| YMCP | .0000 | IN. |
| ZMCP | .0000 | IN. |
| SCALE | .0300 | SCALE |

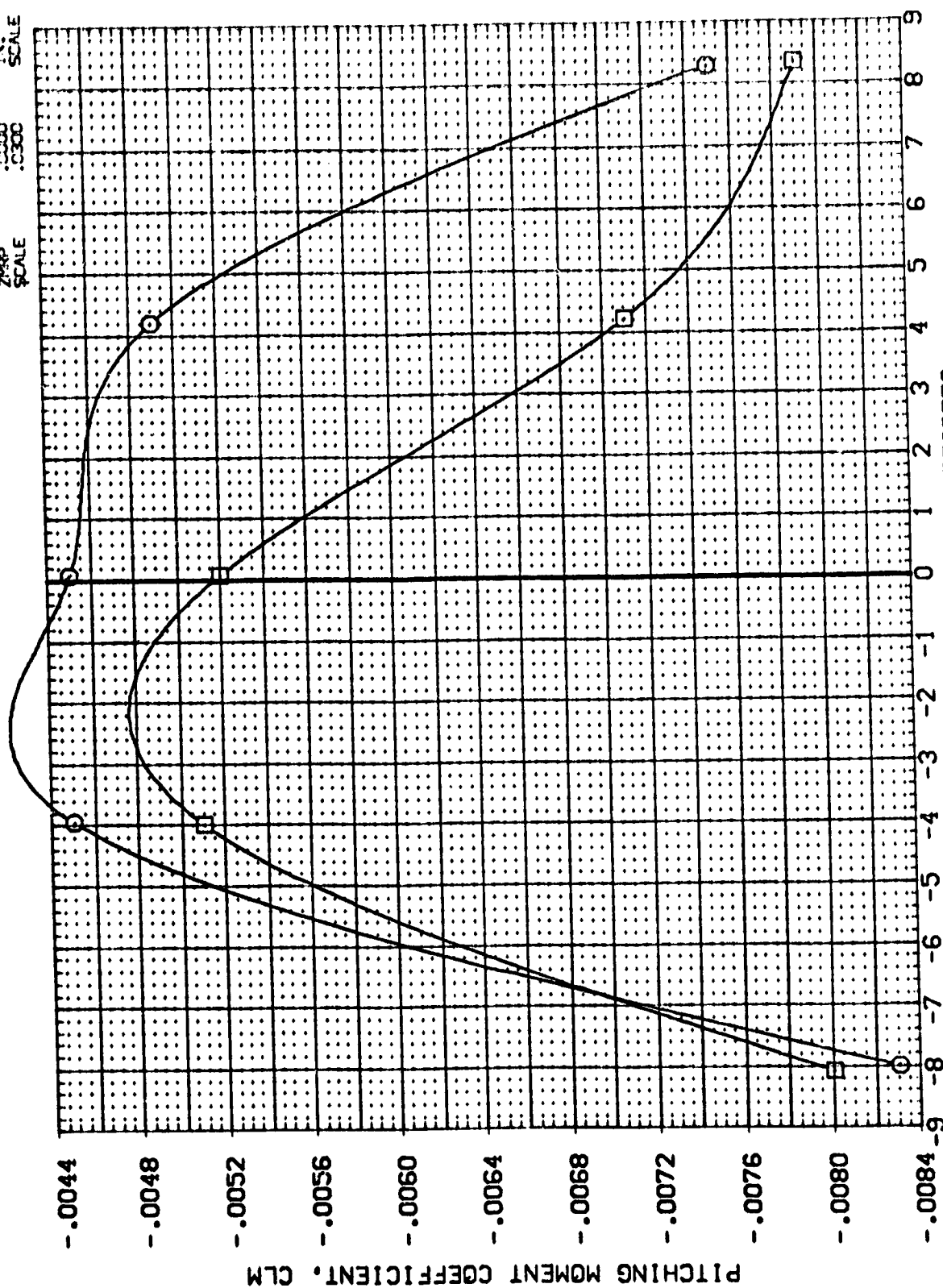


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., MN=0.598, 0.899
SIDESLIP ANGLE, BETA, DEGREES

(CBP038)

AMES 11-707 0A12 02A

SYMBOL
□ ○

MACH
.598
.899

PARAMETRIC VALUES
20.000 ELEVON
.000 RUFLR

.000
40.000

REFERENCE INFORMATION
SPEC 2.4210 SQ.FT.
LREF 39.8490
SPE 39.8490
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 1.000

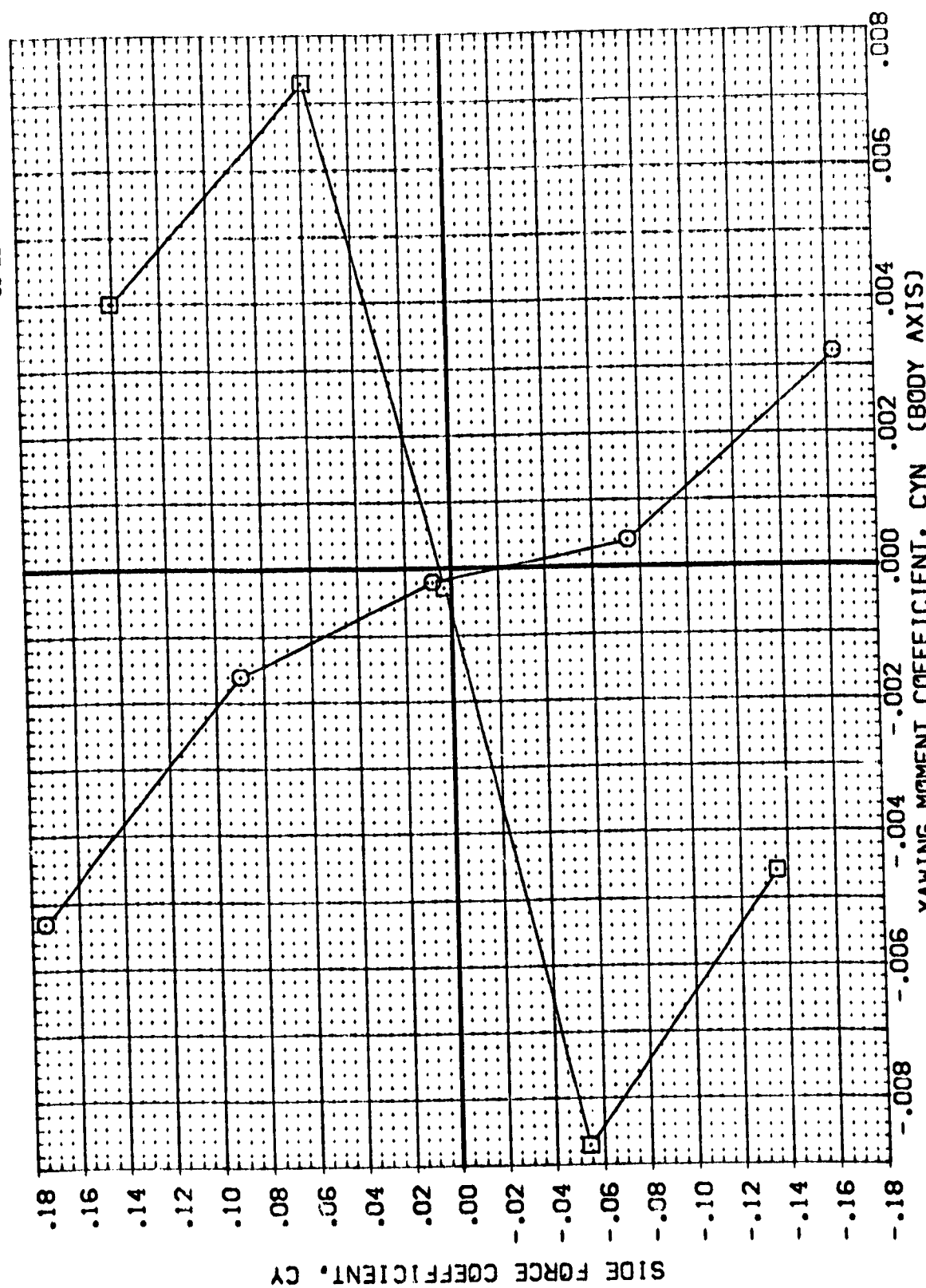


FIG.41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899

AMES 11-707 CA12 G2A

| SYMBOL | MACH | ALPHA | 20.000 | ELEVON | PARAMETRIC VALUES |
|--------|------|--------|--------|--------|-------------------|
| 0 | .598 | | | | .000 |
| 1 | .899 | RUDDER | .000 | RUDDER | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|----------------|
| SREF | 2.4210 SQ. FT. |
| UREF | 39.8490 IN. |
| BREF | 39.8490 IN. |
| XREF | 32.3000 IN. |
| YREF | .0000 IN. |
| ZREF | .0000 IN. |
| SCALE | SCALE |

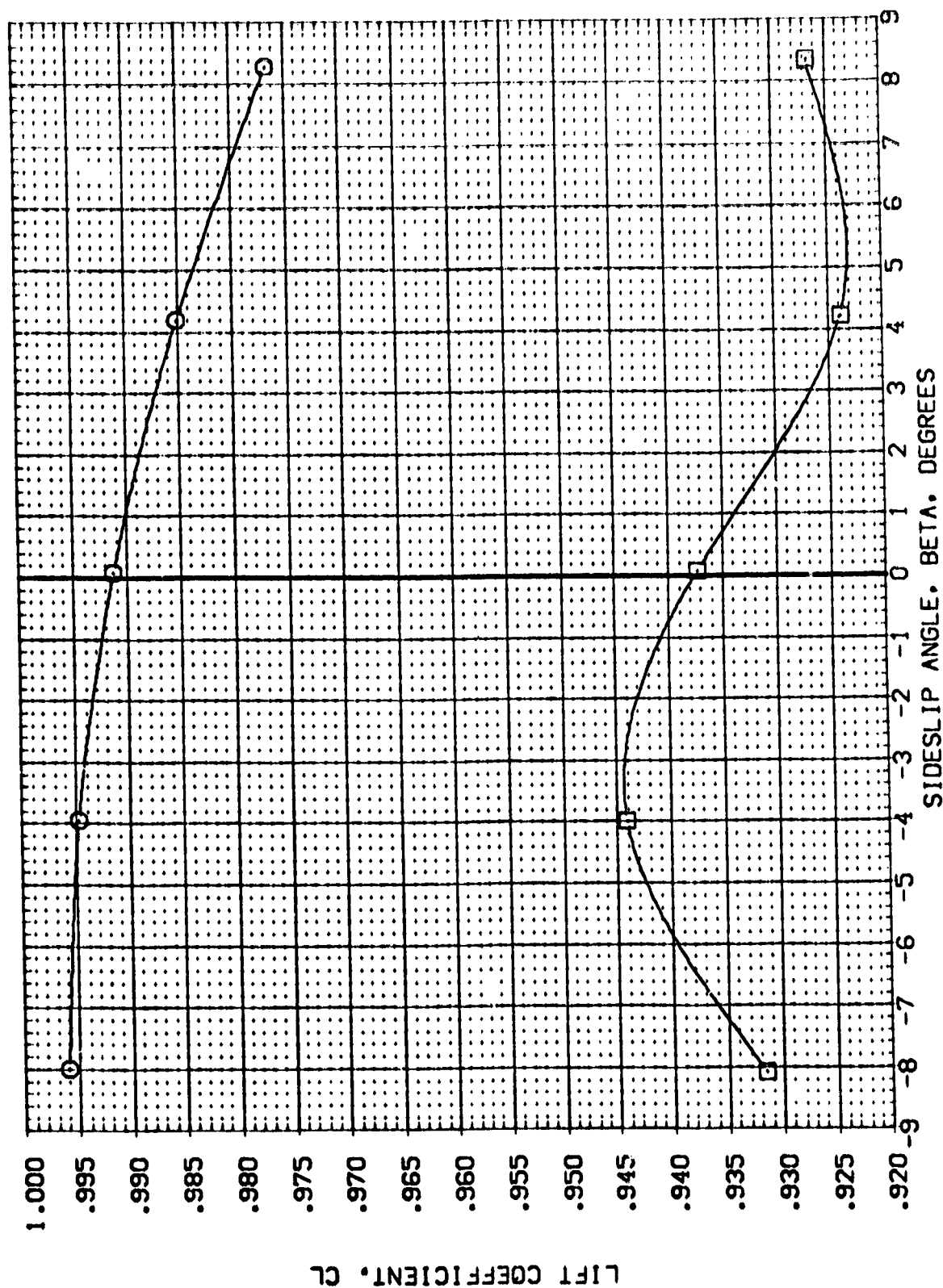


FIG. 41 ORBITER LAT-DIR. DATA AT ALPHA=20 DEGS., RUDFLR=40 DEGS., MN=0.598, 0.899

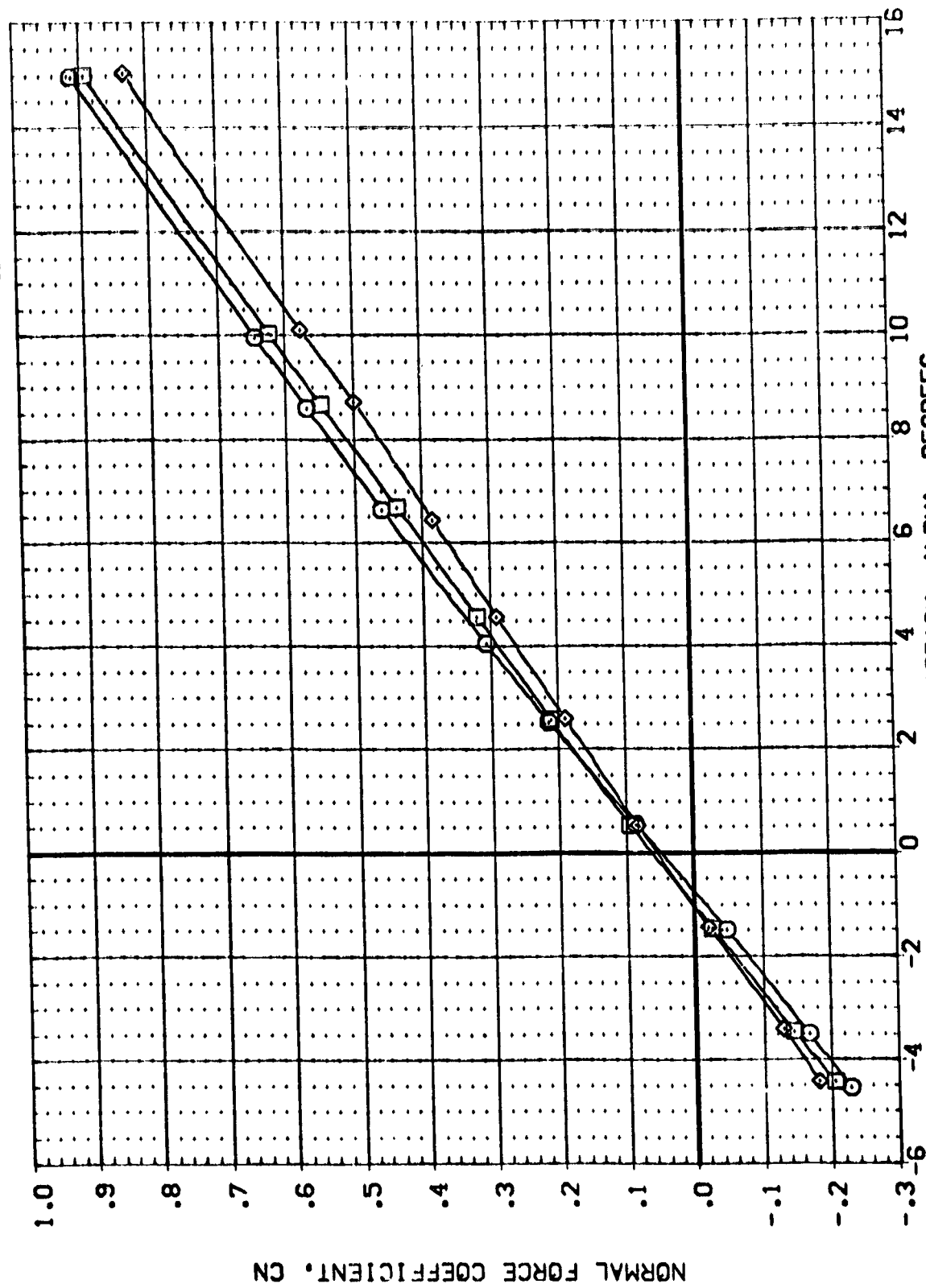
[RBPC039]

AMES 11-707 CA12 02A

REFERENCE INFORMATION
 SPEC 2.4210
 LREF 39.845
 BREF 39.845
 XMRP 32.300
 YMRP 32.300
 ZMRP 32.300
 SCALE 1.000

PARAMETRIC VALUES
 MACH 1.098
 BETA .000
 RUDDER .000
 ELEVON .000
 RUFLR .000

SYMBOL
 ○
 □
 ◇



ANGLE OF ATTACK, ALPHA, DEGREES

FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.098, 1.247, 1.398

(RBP039)

AMES 11-707 0A12 02A

| | | | |
|-------|------|-------------------|------|
| MACH | BETA | PARAMETRIC VALUES | |
| 1.099 | .000 | ELEVON | .000 |
| 1.247 | .000 | RUDFLR | .000 |
| 1.398 | | | |

REFERENCE INFORMATION
 SREF 2.4210
 LREF 20.8150
 BREF 32.8150
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.0000

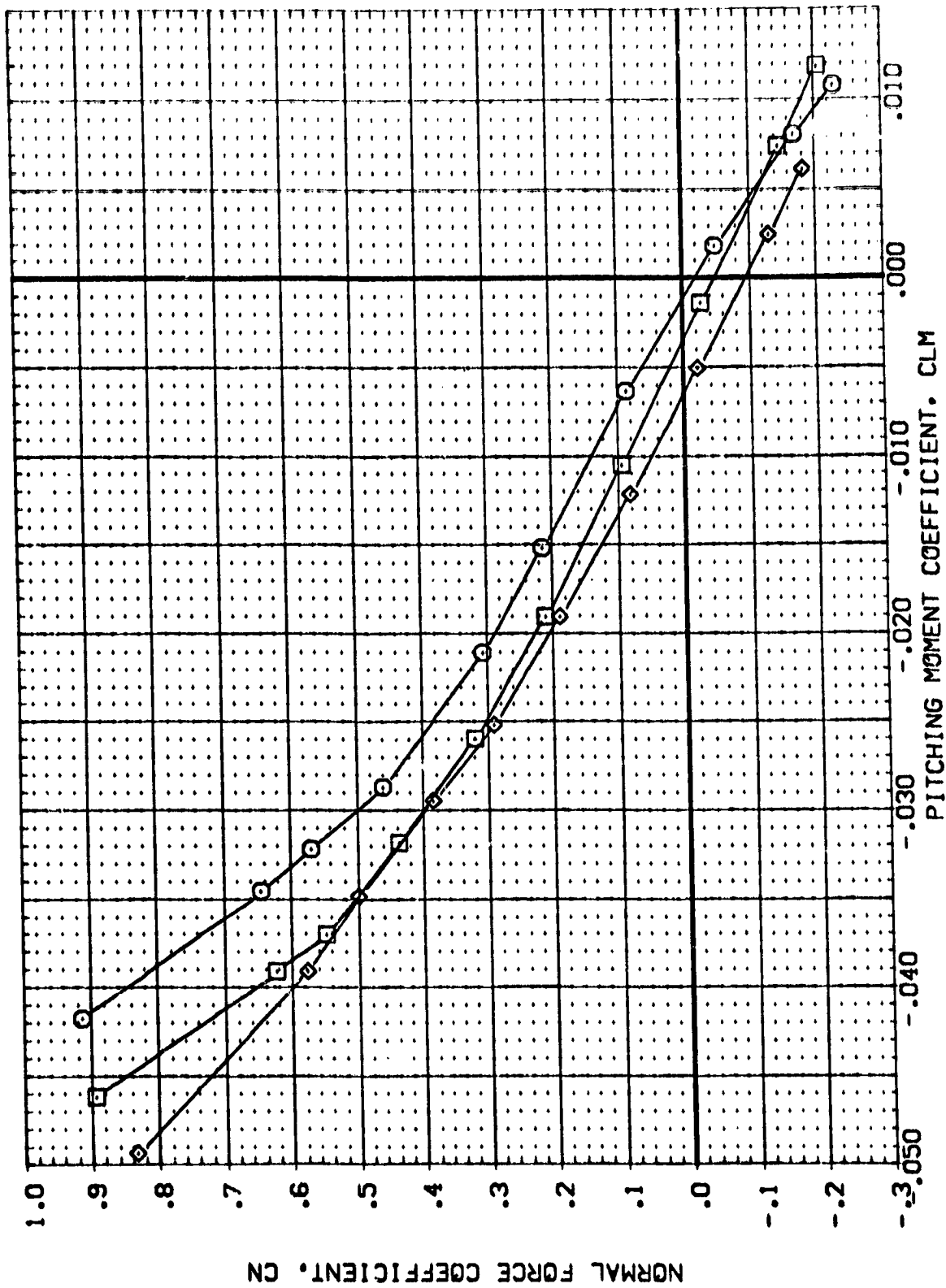


FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

(RBP039)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
 O 1.099 BETA .000 ELEVON .000
 □ 1.247 RUDDER .000
 ◇ 1.398

REFERENCE INFORMATION
 SPEC 2.4210
 LREF 39.8450
 SPREF 39.8450
 XREF 32.1300
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.0000

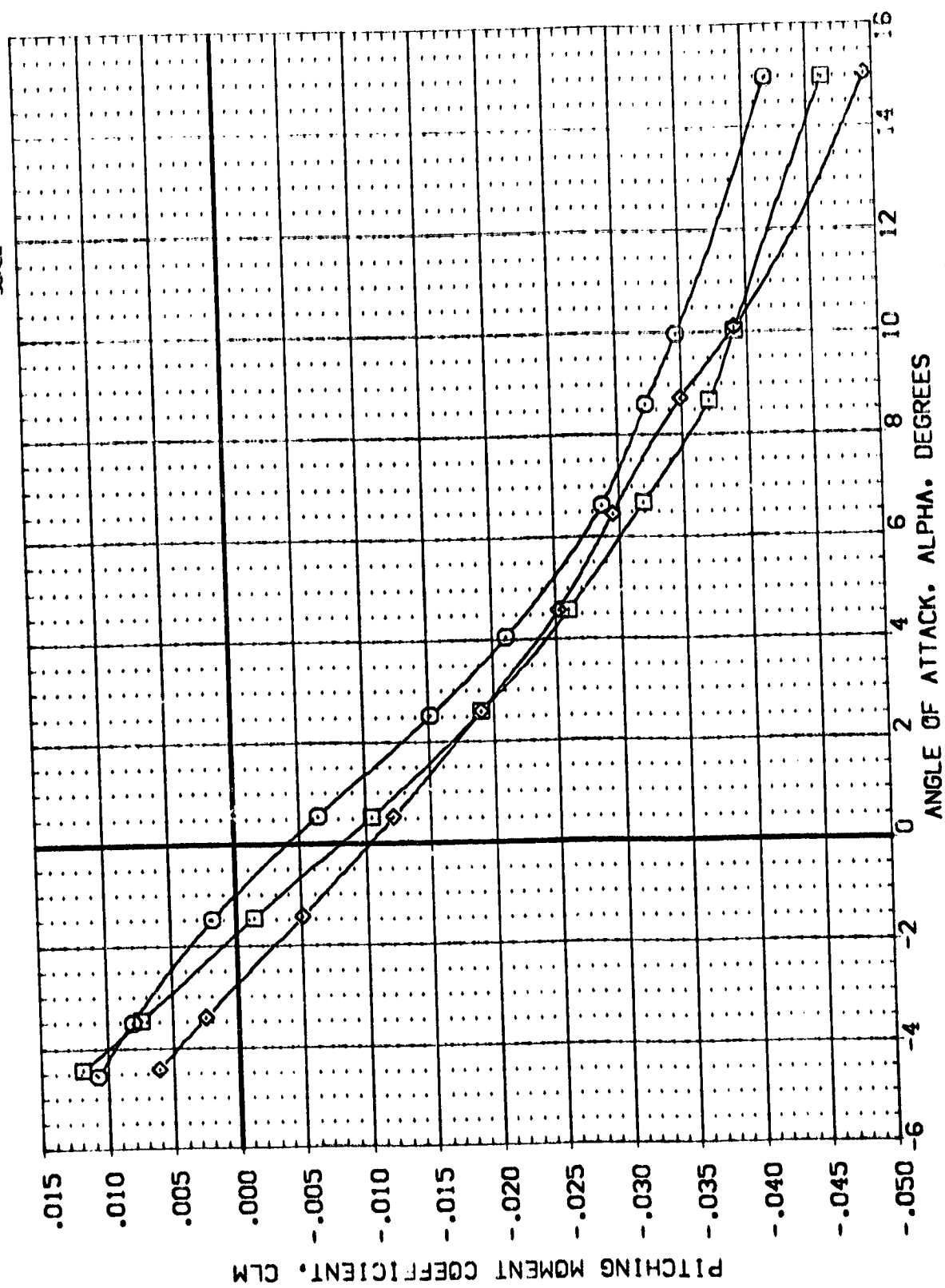


FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

AMES 11-707 0A12 02A

(RBP039)

| | | | |
|--------|-------|------|-------------------|
| SYMBOL | MACH | BETA | PARAMETRIC VALUES |
| ○ | 1.099 | .000 | ELEVON .000 |
| □ | 1.247 | .000 | RUDFLR .000 |
| ◇ | 1.398 | | |

| | |
|-----------------------|---------|
| REFERENCE INFORMATION | |
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XREF | 32.3000 |
| YREF | 32.3000 |
| ZREF | 32.3000 |
| SCALE | 1000 |

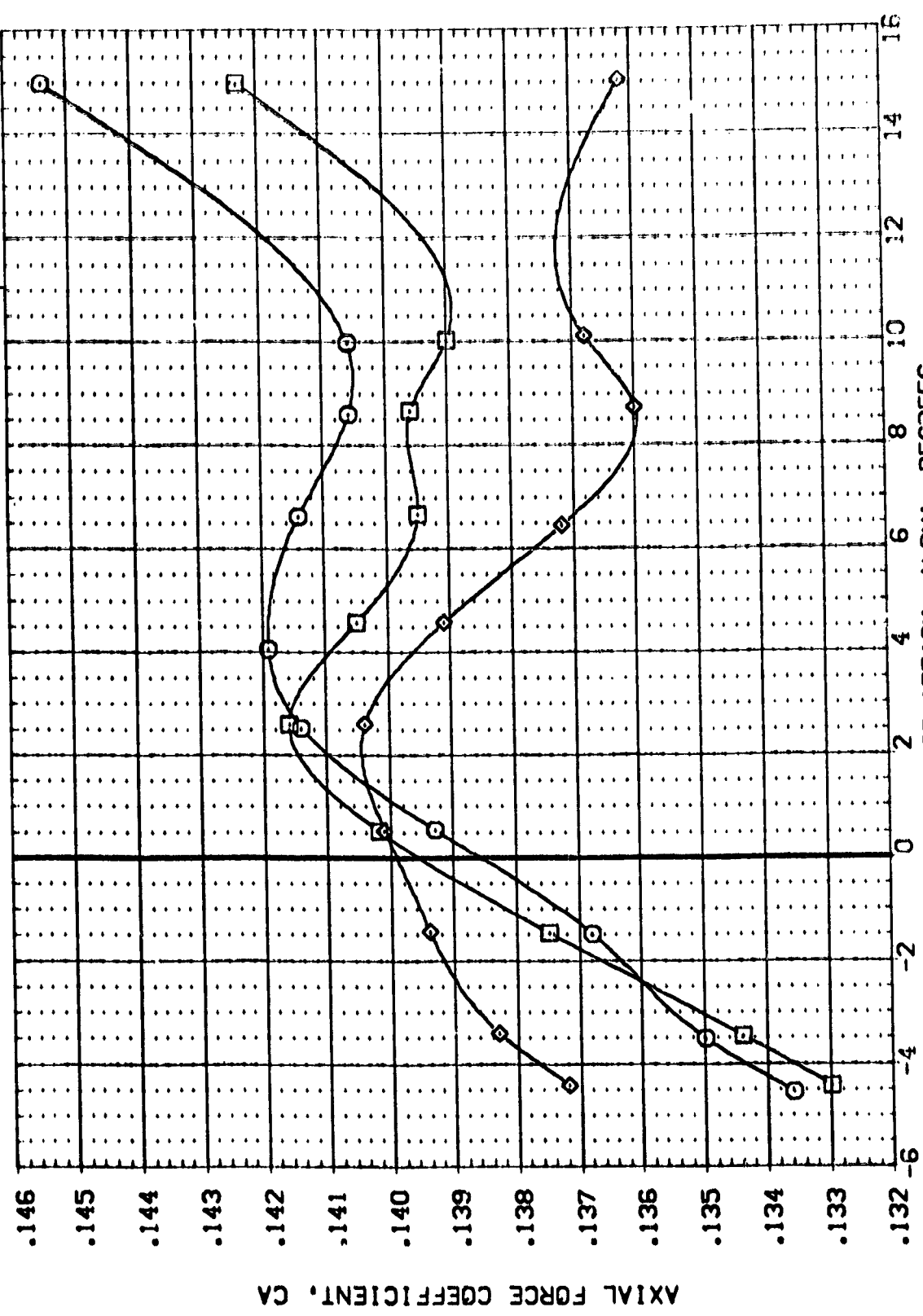


FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

| SYMBOL | MACH | BETA | PARAMETRIC VALUES |
|--------|-------|--------|-------------------|
| ○ | 1.099 | BETA | .000 ELEVEN |
| □ | 1.247 | RUDDER | .000 RUDDER |
| ◇ | 1.398 | | |

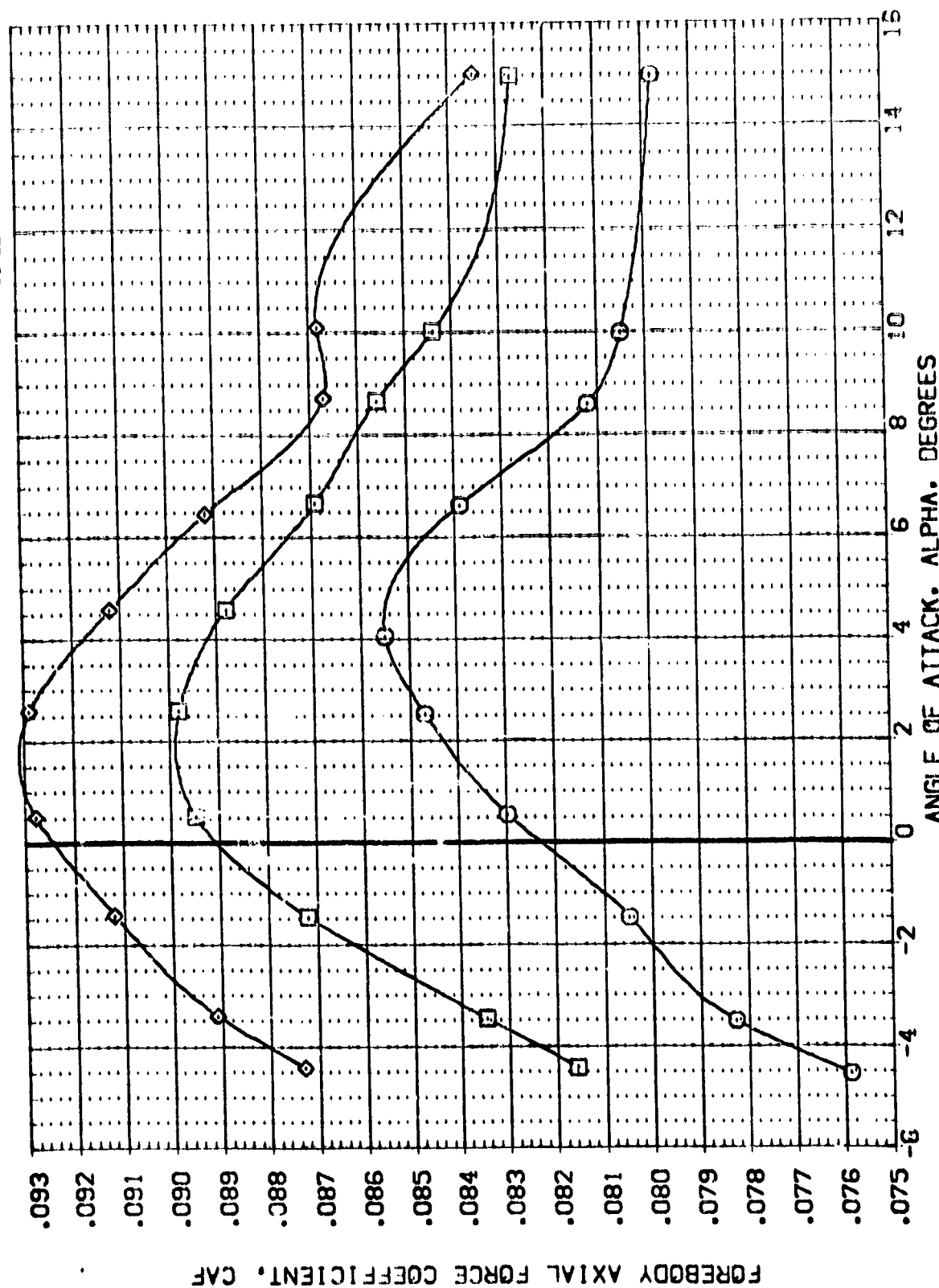
[illegible]

FIG. 42 ORBITER LONGITUDINAL DATA, MACH NOS. = 1.099, 1.247, 1.398

(ABP039)

AMES 11-707 0A12 02A

| | | | | | |
|--------|-------|------|--------|-------------------|-----------------------|
| SYMBOL | MACH | BETA | RUDDER | PARAMETRIC VALUES | REFERENCE INFORMATION |
| ○ | 1.099 | | | SREF | 2.4210 |
| □ | 1.247 | | | LREF | 39.8490 |
| ◇ | 1.398 | | | BREF | 39.8490 |
| | | | | XREF | 32.3000 |
| | | | | YREF | .0000 |
| | | | | ZREF | .0000 |
| | | | | SCALE | .0300 |

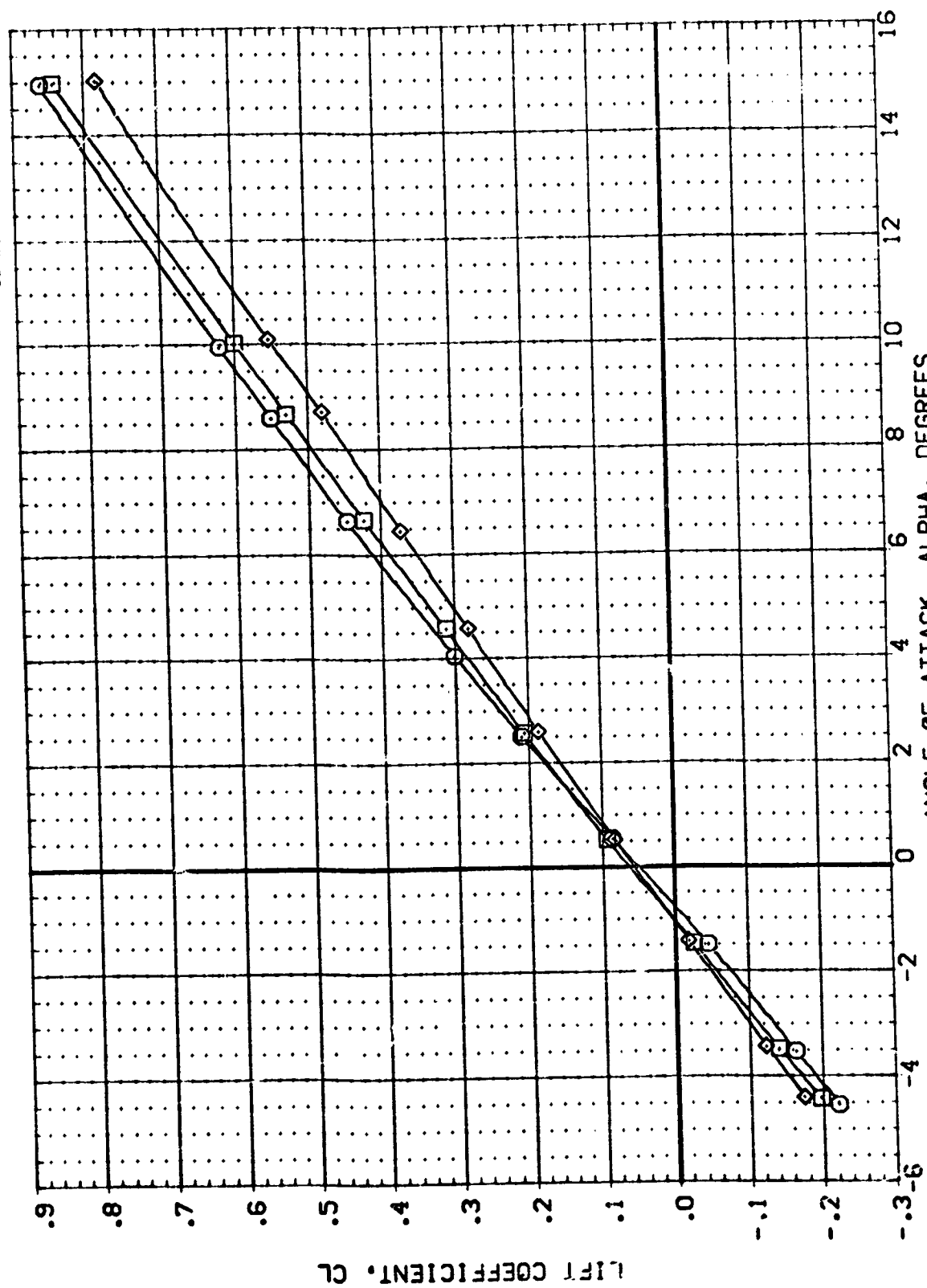


FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

(ABP039)

AMES 11-707 0A12 02A

SYMBOL
 MACH
 1.099
 1.247
 1.398

PARAMETRIC VALUES
 BETA .000
 ELEVON .000
 RUDDER .000
 RUDFLR .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000

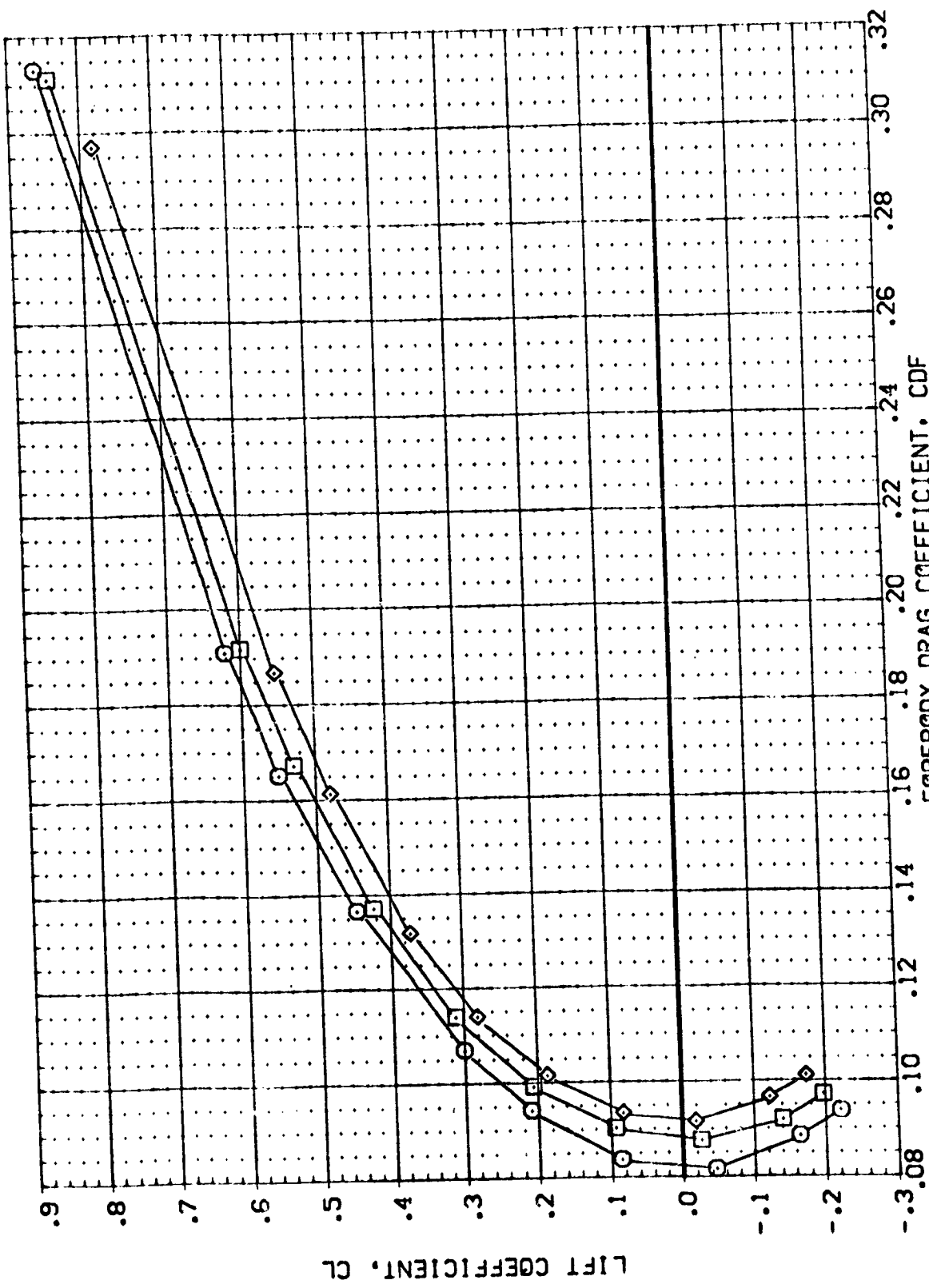


FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

[ABP039]

AMES 11-707 0A12 02A

| SYMBOL | MACH | | PARAMETRIC VALUES | | REFERENCE INFORMATION | |
|--------|-------|-------|-------------------|--------|-----------------------|---------|
| | 1.099 | 1.247 | BETA | ELEVON | SREF | SC.FT. |
| ○ | 1.099 | 1.247 | .000 | .000 | LREF | 39.8450 |
| □ | 1.099 | 1.247 | .000 | .000 | BREF | 39.8450 |
| ◇ | 1.099 | 1.247 | .000 | .000 | YMRP | 32.3000 |
| | | | | | ZMRP | .0000 |
| | | | | | SCALE | .0300 |

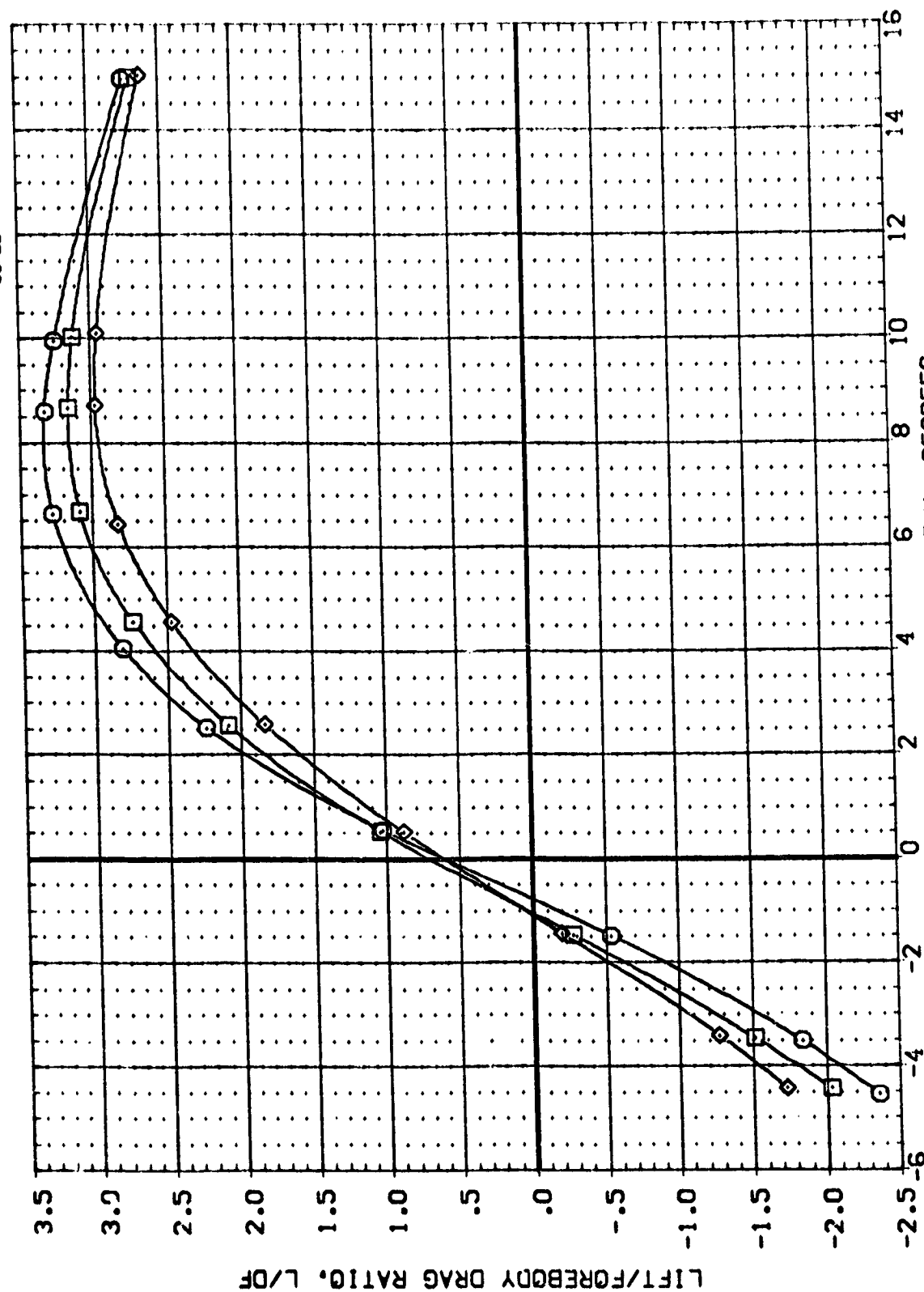


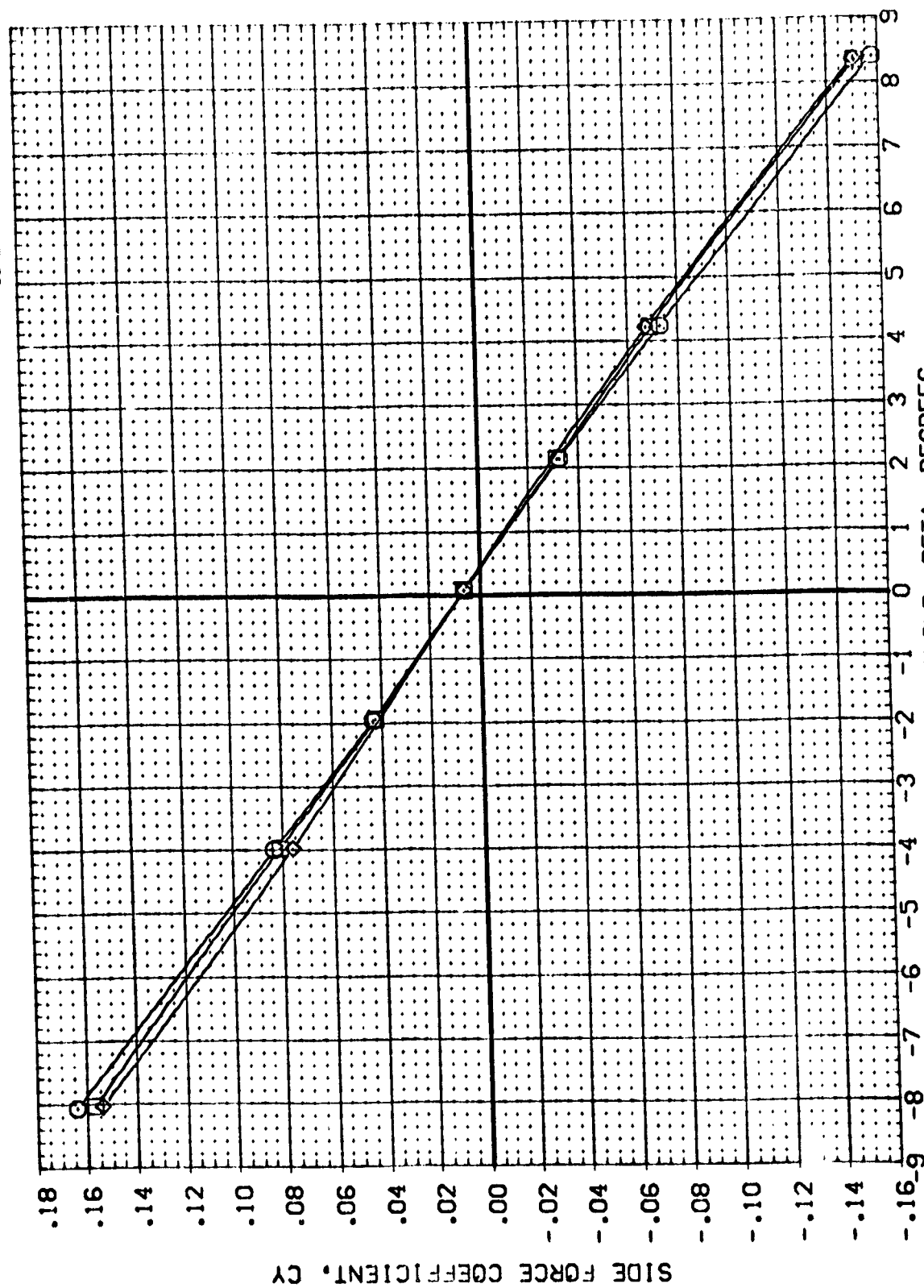
FIG.42 ORBITER LONGITUDINAL DATA, MACH NOS.=1.099, 1.247, 1.398

(RBP040)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
○ 1.099 ALPHA .500 ELEVON .000
□ 1.250 RUDER .000
◇ 1.396

REFERENCE INFORMATION
SREF 2.42°C
LREF 39.8450
BREF 39.8450
XMRP 32.300
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396

==

AMES 11-707 0A12 02A

(RBP040)

| | | | | | |
|--------|-------|-------------------|------|--------|-----------------------|
| SYMBOL | MACH | PARAMETRIC VALUES | | | REFERENCE INFORMATION |
| | | ALPHA | .500 | ELEVON | |
| ○ | 1.099 | CLUTTER | .000 | RUDFLR | .000 |
| □ | 1.250 | | | | |
| ◇ | 1.396 | | | | |

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SC.FT. |
| LREF | 39.8450 | |
| BREF | 39.8450 | |
| XMRP | 32.3000 | |
| YMRP | .0000 | |
| ZMRP | .0000 | |
| SCALE | .0300 | |

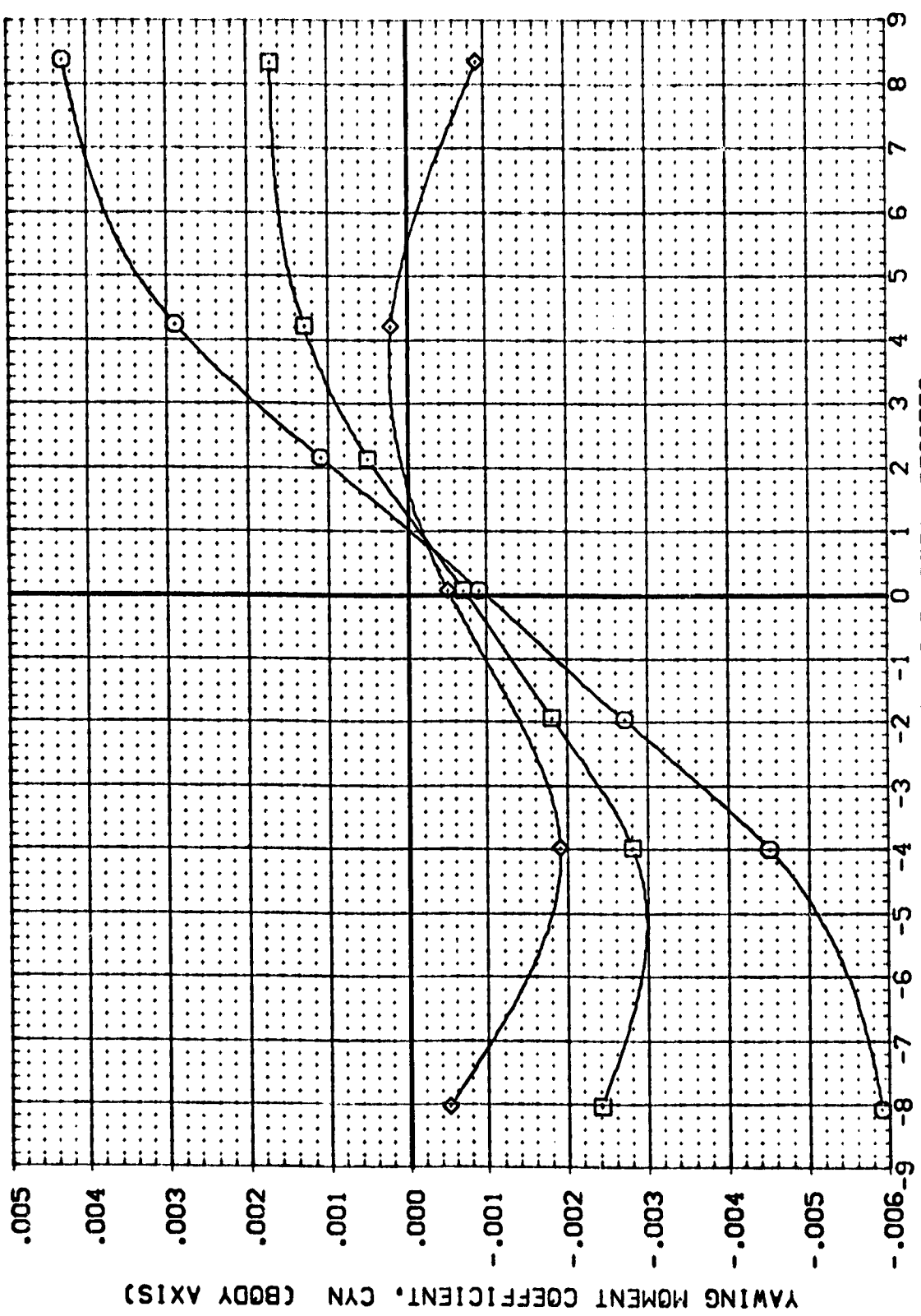


FIG.43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396

(RBP040)

AMES 11-707 0A12 02A

| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | .000 |
|--------|-------|-------|-------------------|--------|------|
| ○ | 1.099 | RUDER | .000 | RUDFLR | .000 |
| □ | 1.250 | | | | |
| ◇ | 1.396 | | | | |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.5000
YREF 0.0000
ZREF 0.0000
SCALE .0333
SG.FT.

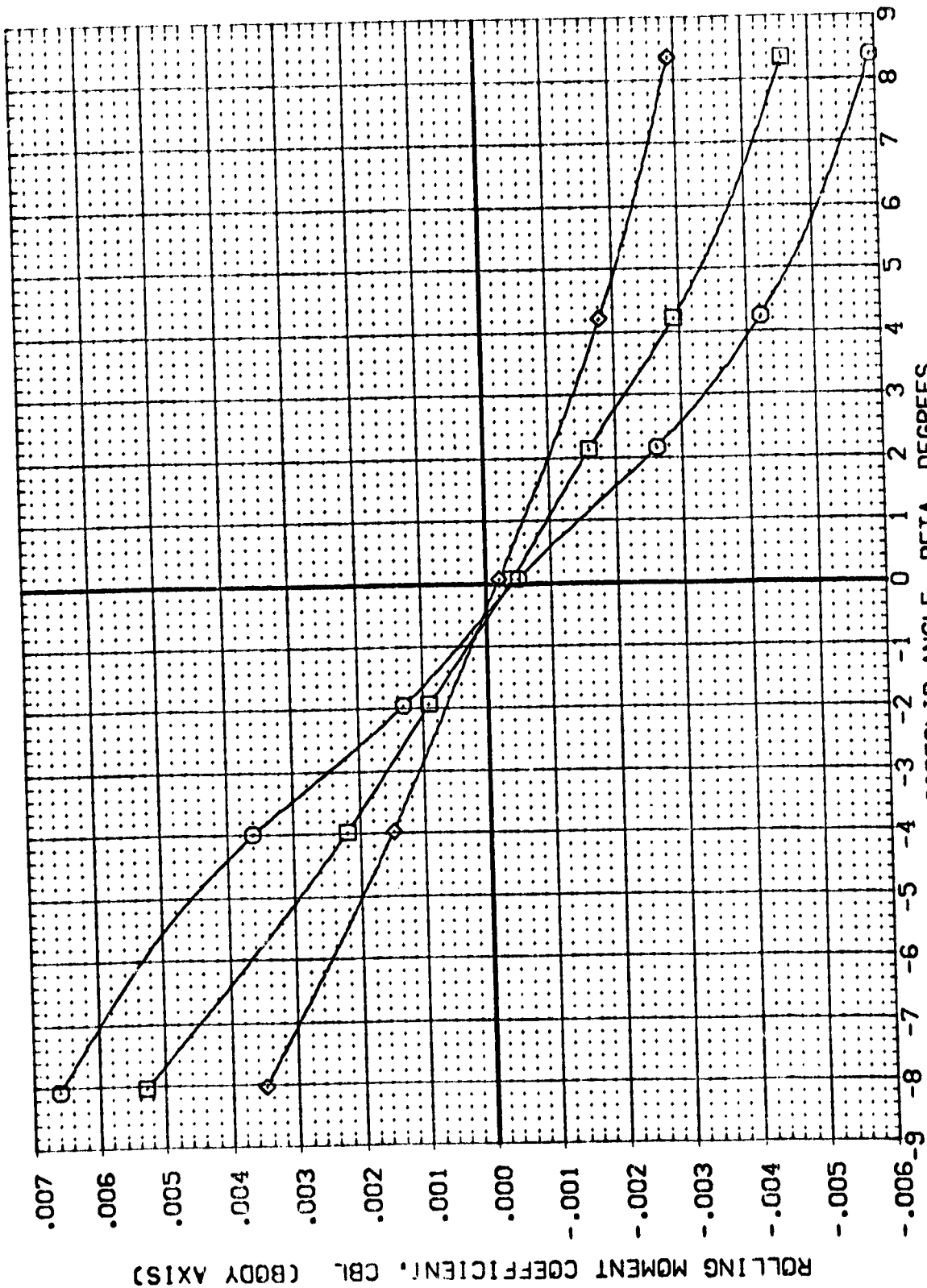


FIG.43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396

(RBP040)

AMES 11-707 0A12 02A

| SYMBOL | | MACH | | PARAMETRIC VALUES | | REFERENCE INFORMATION | |
|--------|--|-------|--|-------------------|--------|-----------------------|---------|
| | | | | ALPHA | ELEVON | | |
| ○ | | 1.099 | | .500 | .000 | SREF | 2.4210 |
| □ | | 1.250 | | .000 | RUD/LR | LREF | 39.8490 |
| ◇ | | 1.396 | | | | BREF | 39.8490 |
| | | | | | | XPRP | 32.3000 |
| | | | | | | YPRP | .0000 |
| | | | | | | ZPRP | .0000 |
| | | | | | | SCALE | .0300 |

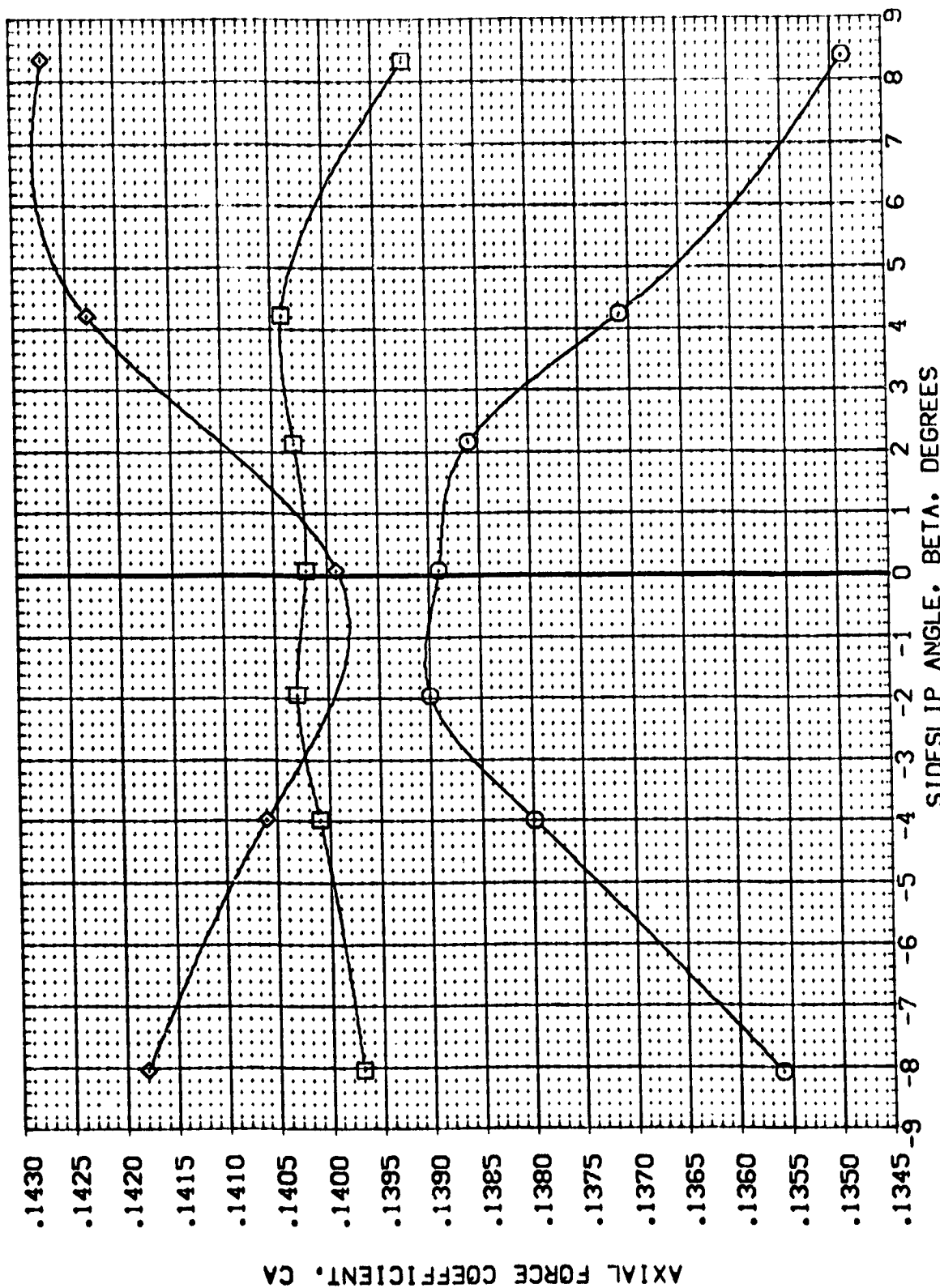


FIG.43 ORBITER LAT-OIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396

(RBP040)

AMES 11-707 CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 ○ 1.098 .000 ELEVON .000
 □ 1.250 .000 RUDDLR .000
 ◇ 1.396

REFERENCE INFORMATION
 SREF 2.4210
 LREF 35.8450
 BREF 39.8450
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE .0300

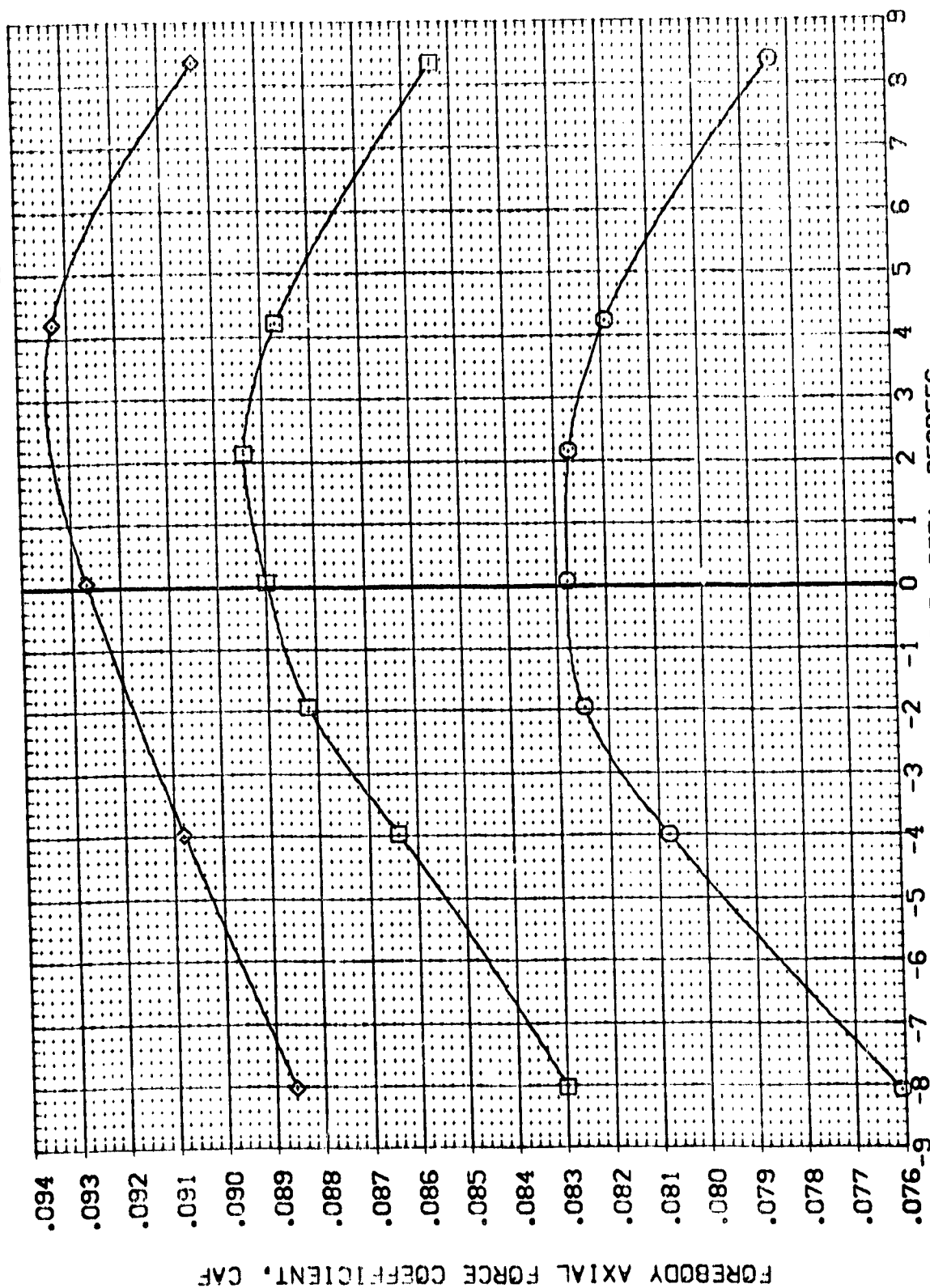


FIG.43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396
 SIDESLIP ANGLE, BETA, DEGREES

(R8PC40)

WES 11-707 0A12 02A

SYMBOL: \diamond \square \circ
MAC: .039
ALPHA: .500
RUDER: .000
ELEVON: .000
RUFLR: .000

REFERENCE INFORMATION
SPEED: 2.4210
WE: 38.8480
SFC: 38.8480
X: 32.0000
Y: 32.0000
Z: 32.0000
SCALE: 1.0000

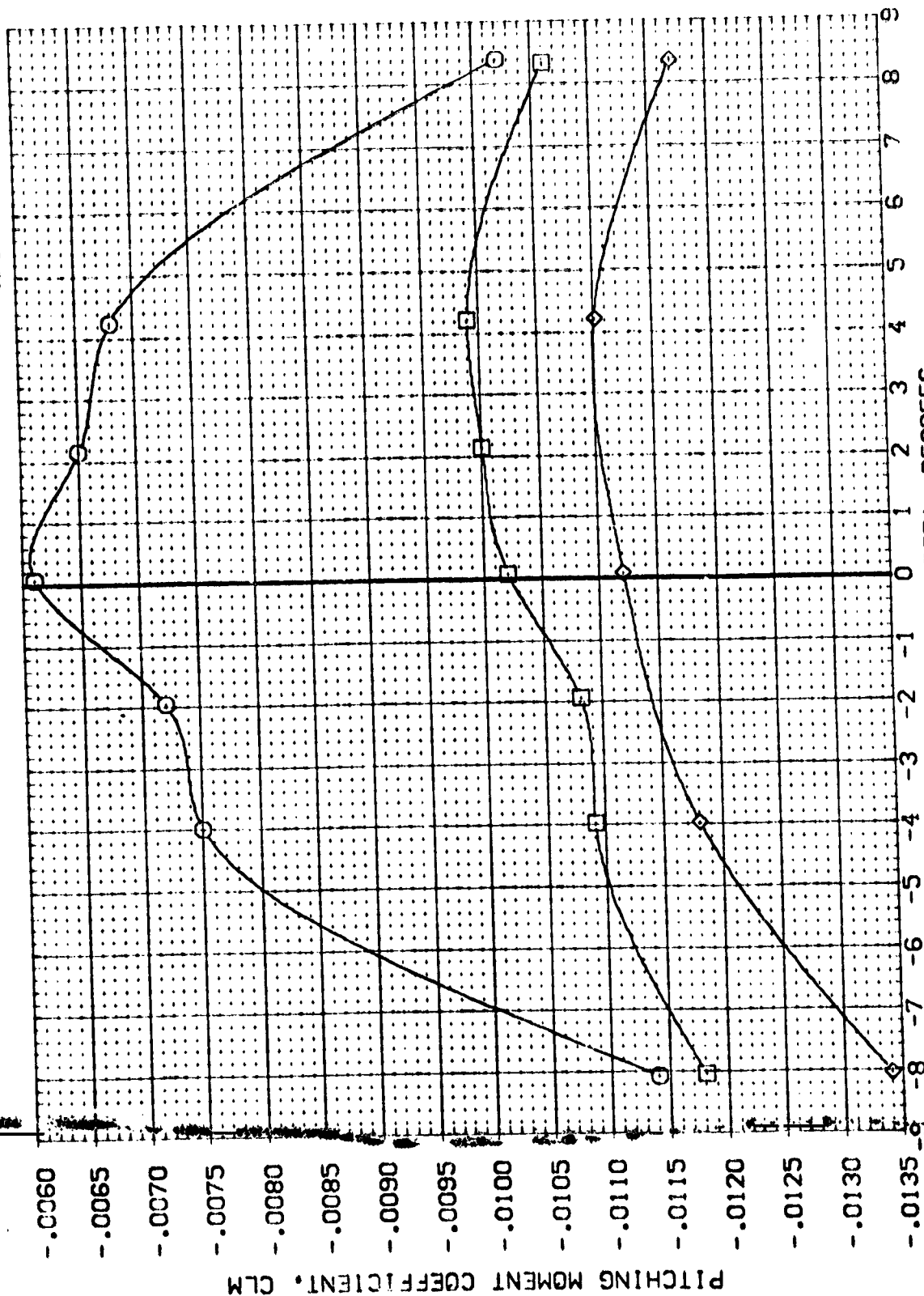


FIG.43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG., MN=1.099, 1.250, 1.396

AMES 11-707 3A12 02A

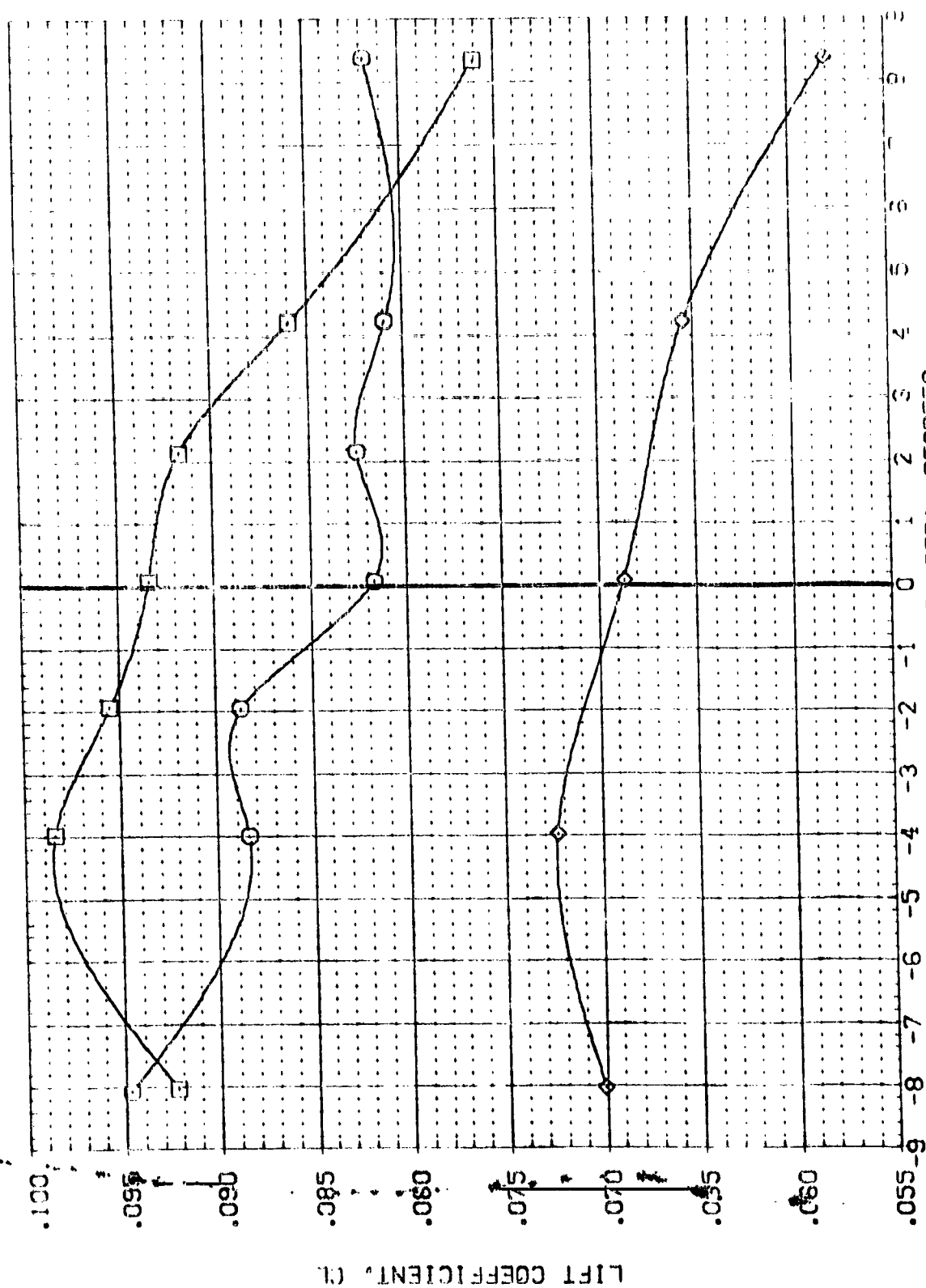
[illegible]

FIG. 43 ORBITER LAT-DIR. DATA AT ALPHA=0.5 DEG. $\mu V=1.000$, $\sigma_{\mu V}=0.001$

AVES 11-707 CA12 G2A

SECRET

100

ALPHA
RUBEN

CCC-31-
CCC-3-
E-Invited

SECRET

88

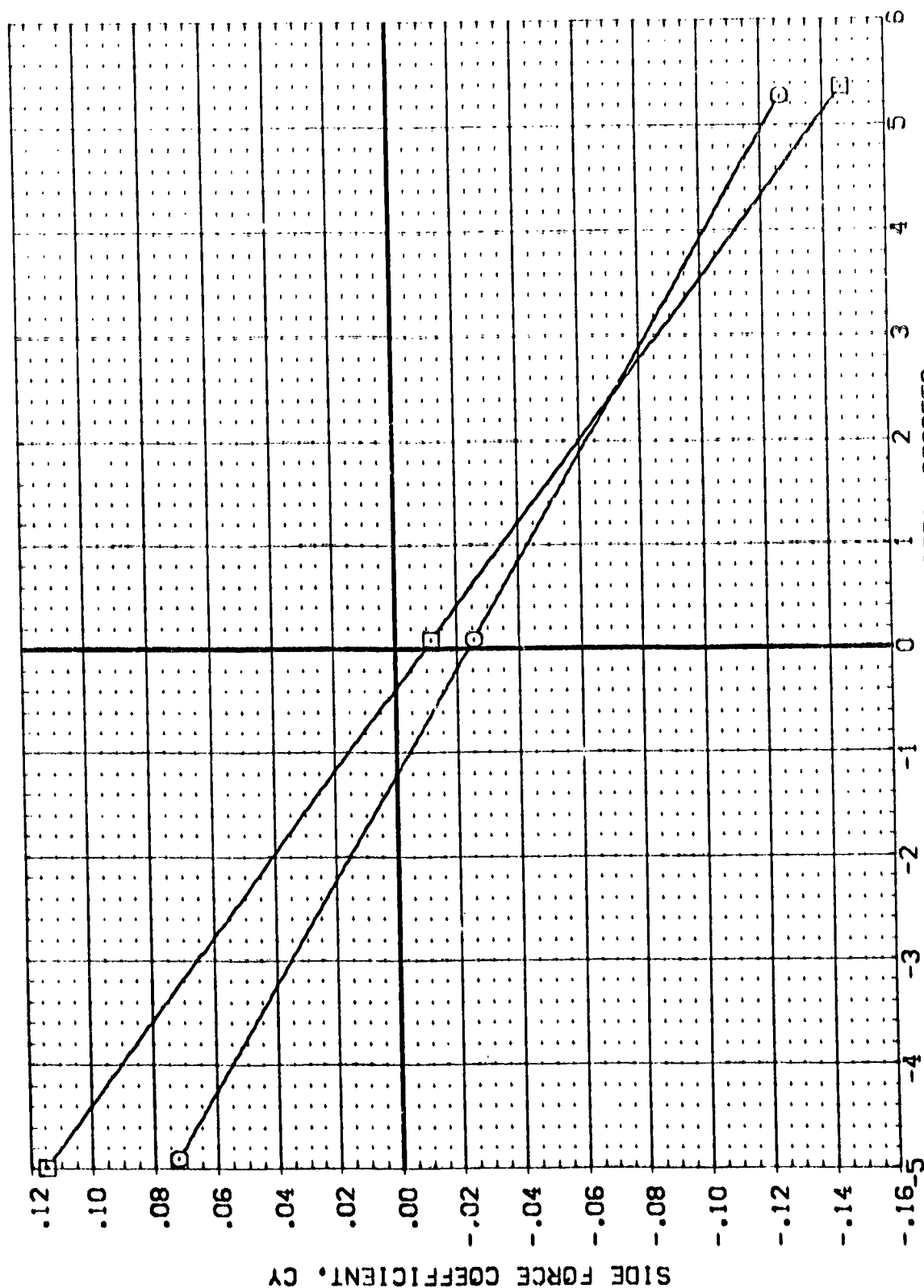
[illegible]

FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS.,
 SLD=0.800, 0.900
 PAGE 2500

1
2
3
4
5
6
7
8

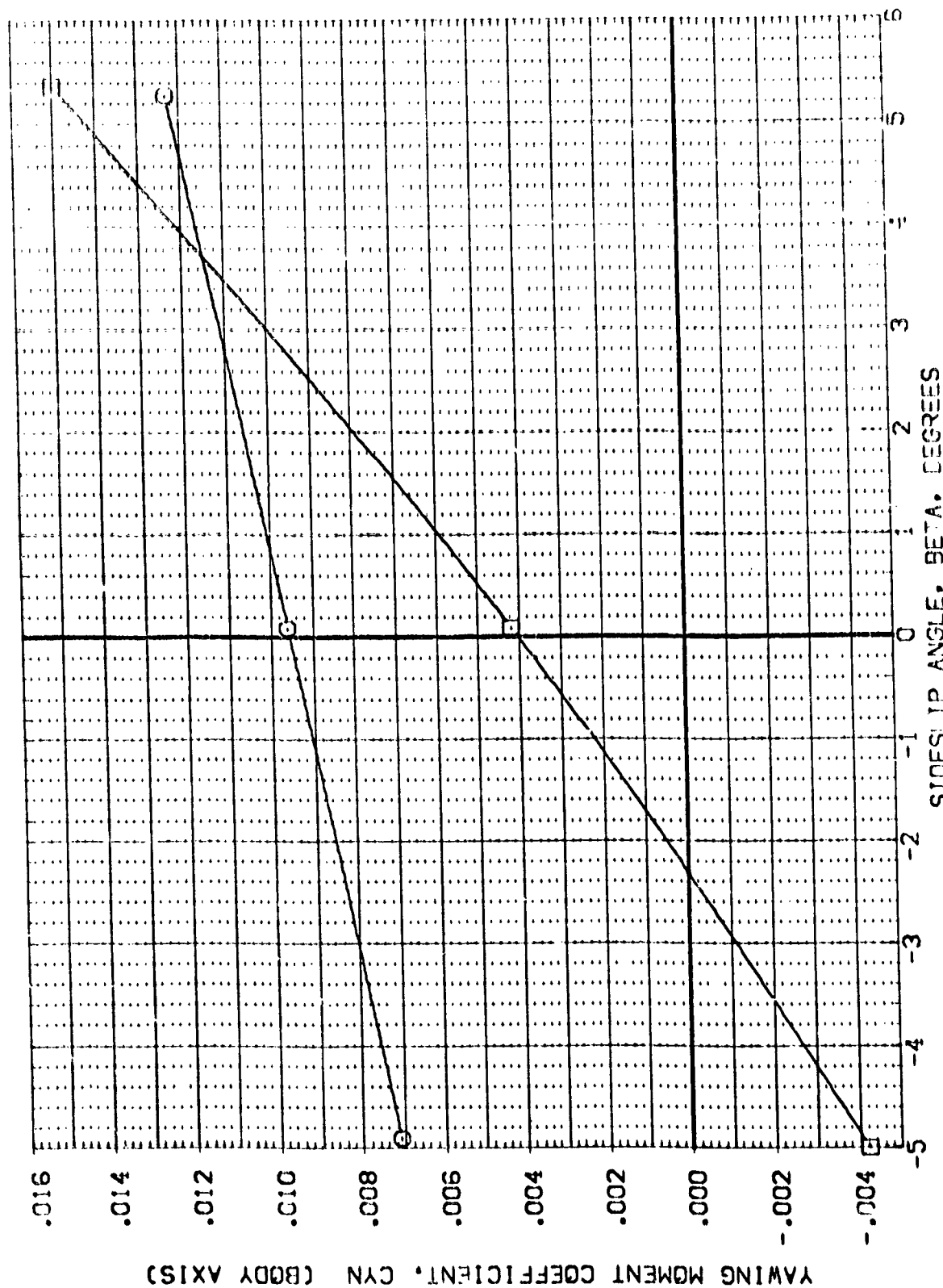
[illegible]

FIG. 44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. ROGER=-10 DEGS. MAG. 20.0-20.9

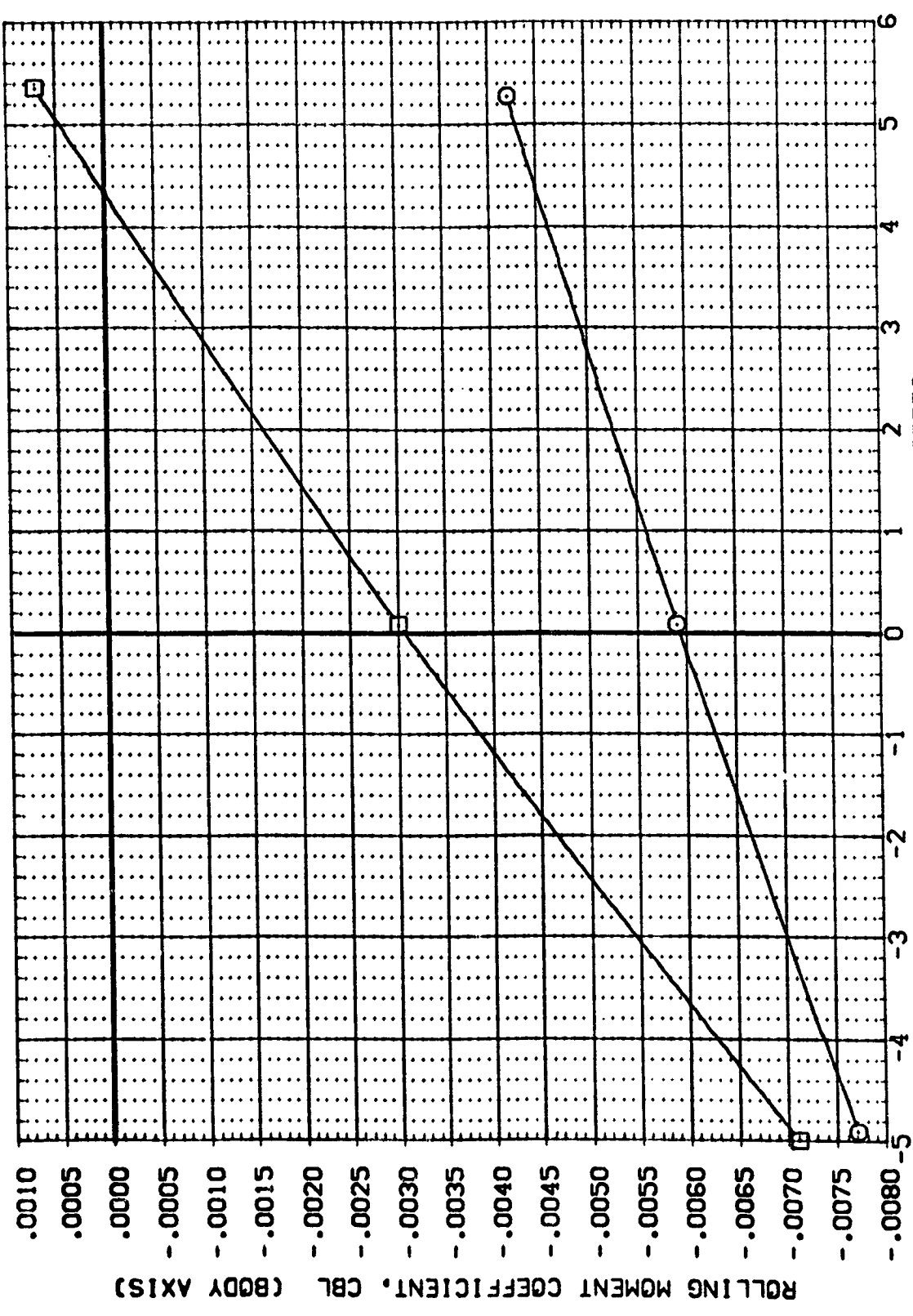
(RBPO41)

AMES 11-707 0A12 02A

SYMBOL MACH
O .600
□ .901

PARAMETRIC VALUES
ALPHA -4.000 ELEVON .000
RUDDER -10.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 28.8490 IN.
BREF 38.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901

(RBPO411)

AMES 11-707 0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|------|-------------------|--------|
| | | ALPHA | ELEVON |
| □ | .500 | -4.000 | .000 |
| ○ | .901 | -10.000 | .000 |

REFERENCE INFORMATION

| | SO. FT. |
|-------|---------|
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0300 |

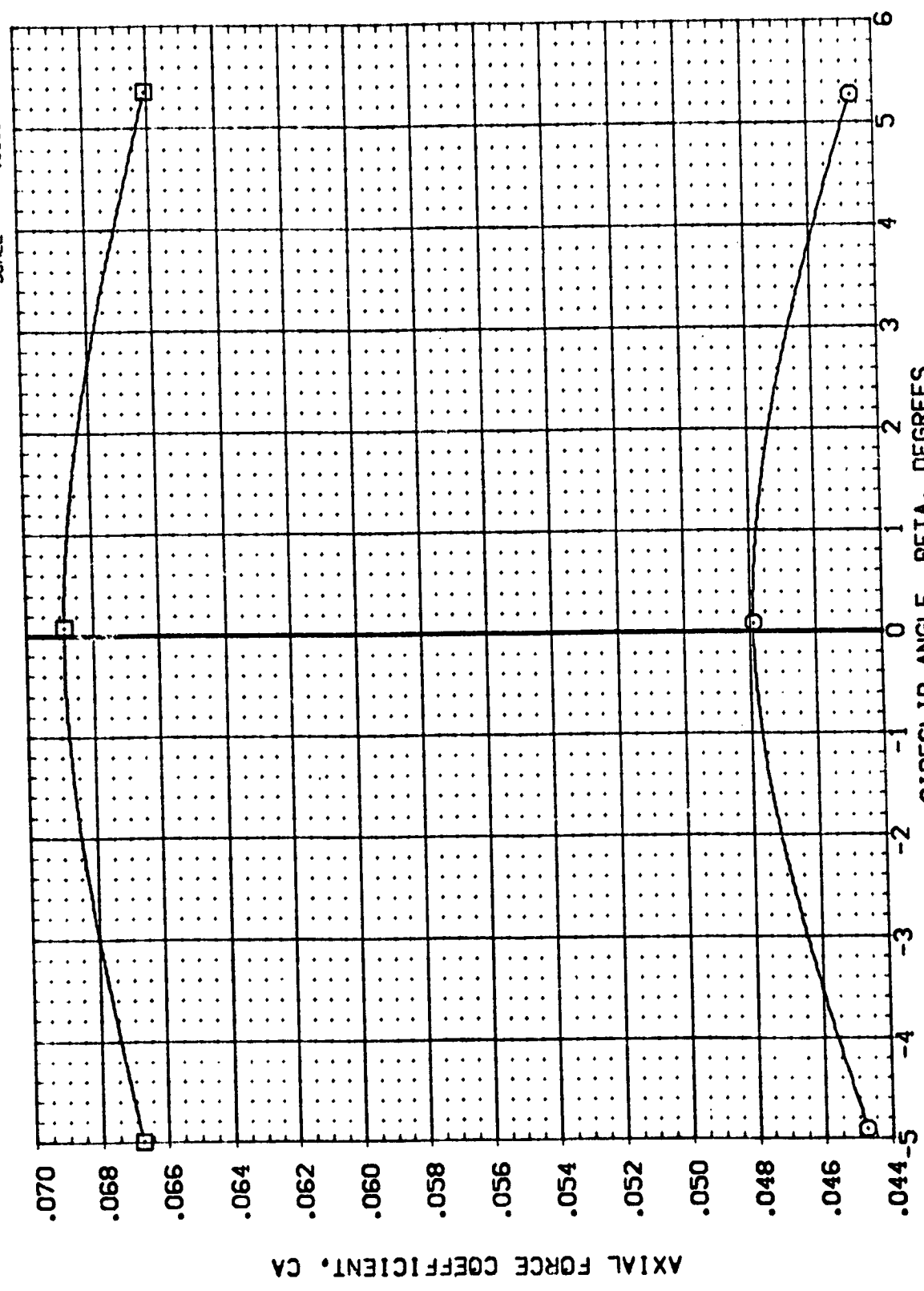


FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901

PAGE 362

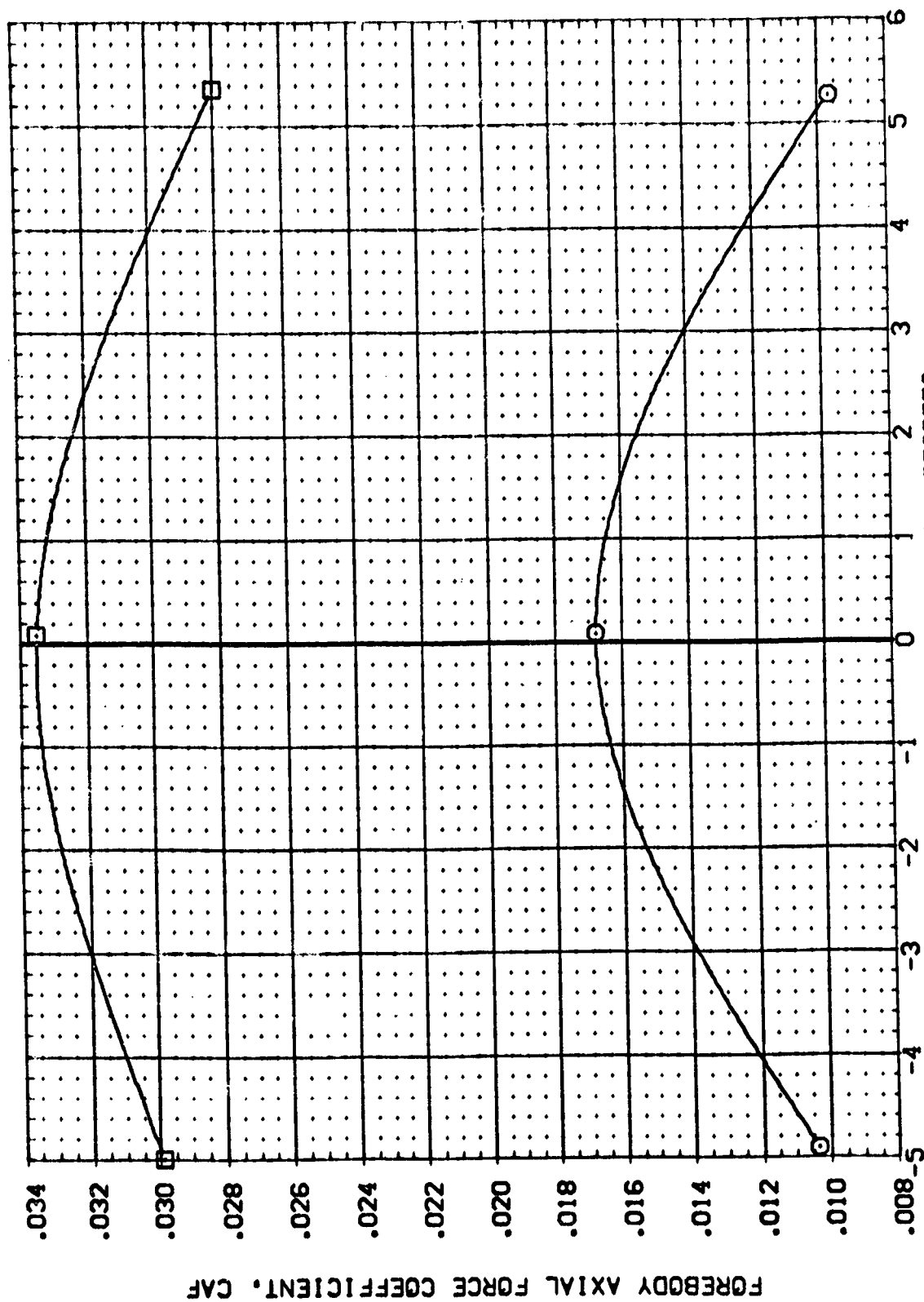
(RBP041)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 ○ .600
 □ .901

PARAMETRIC VALUES
 ELEVON .000
 RUDDL R .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8490 IN.
 BREF 38.8490 IN.
 XPRP 32.3000 IN.
 YPRP 0.0000 IN.
 ZPRP 0.0000 IN.
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901

(RBP041)

AMES 11-707 0A12 02A

SYMBOL

MACH

ALPHA

RUDDER

PARAMETRIC VALUES

-4.000

-10.000

RUELR

.000

.000

.000

REFERENCE INFORMATION

SREF

LREF

BREF

YMRP

ZMRP

SCALE

2.4210

39.8490

39.8490

32.3000

.0000

.0000

.0300

SO.FT.

IN.

IN.

IN.

IN.

IN.

SCALE

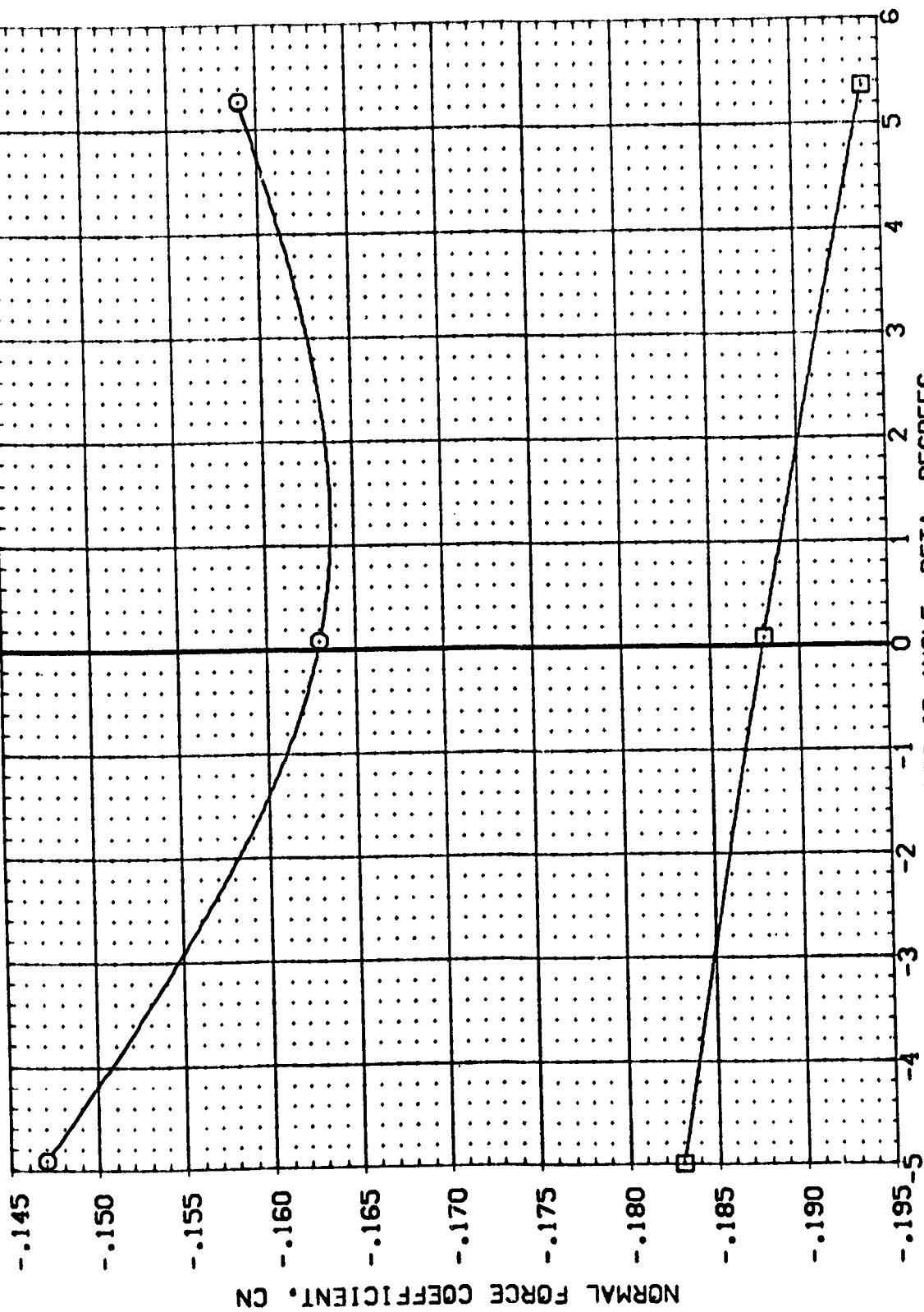


FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600, 0.901

(RBP041)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .600 .901 -4.000 ELEVON .000
○ .901 -10.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XPRP 32.3000 IN.
YPRP .0000 IN.
ZPRP .0000 IN.
SCALE .0300

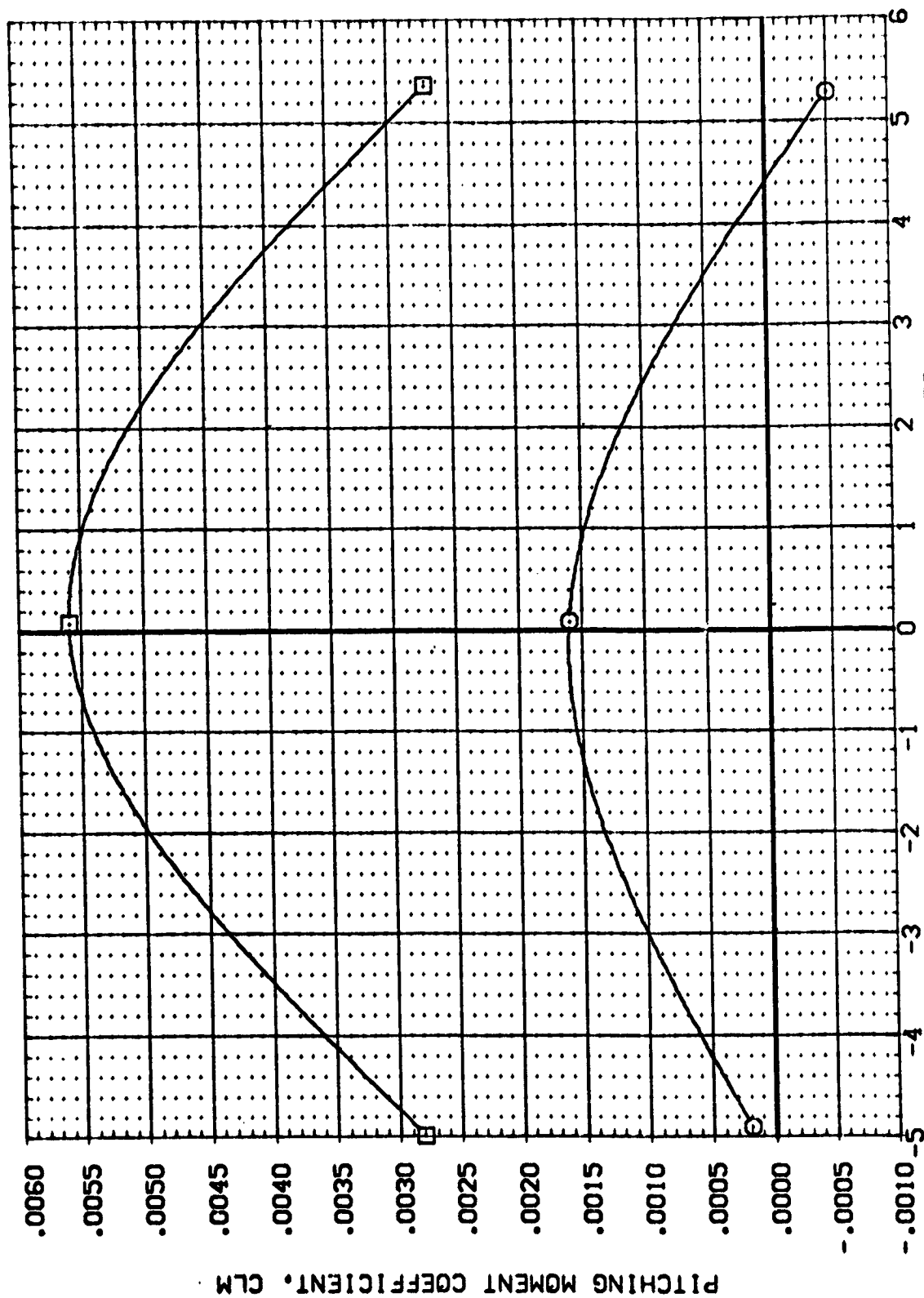


FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901

AMES 11-707 CA12 02A

(RBPO41)

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 ○ .600 .501 .000 ELEVON .000
 □ .000 .000 RUOFLR .000

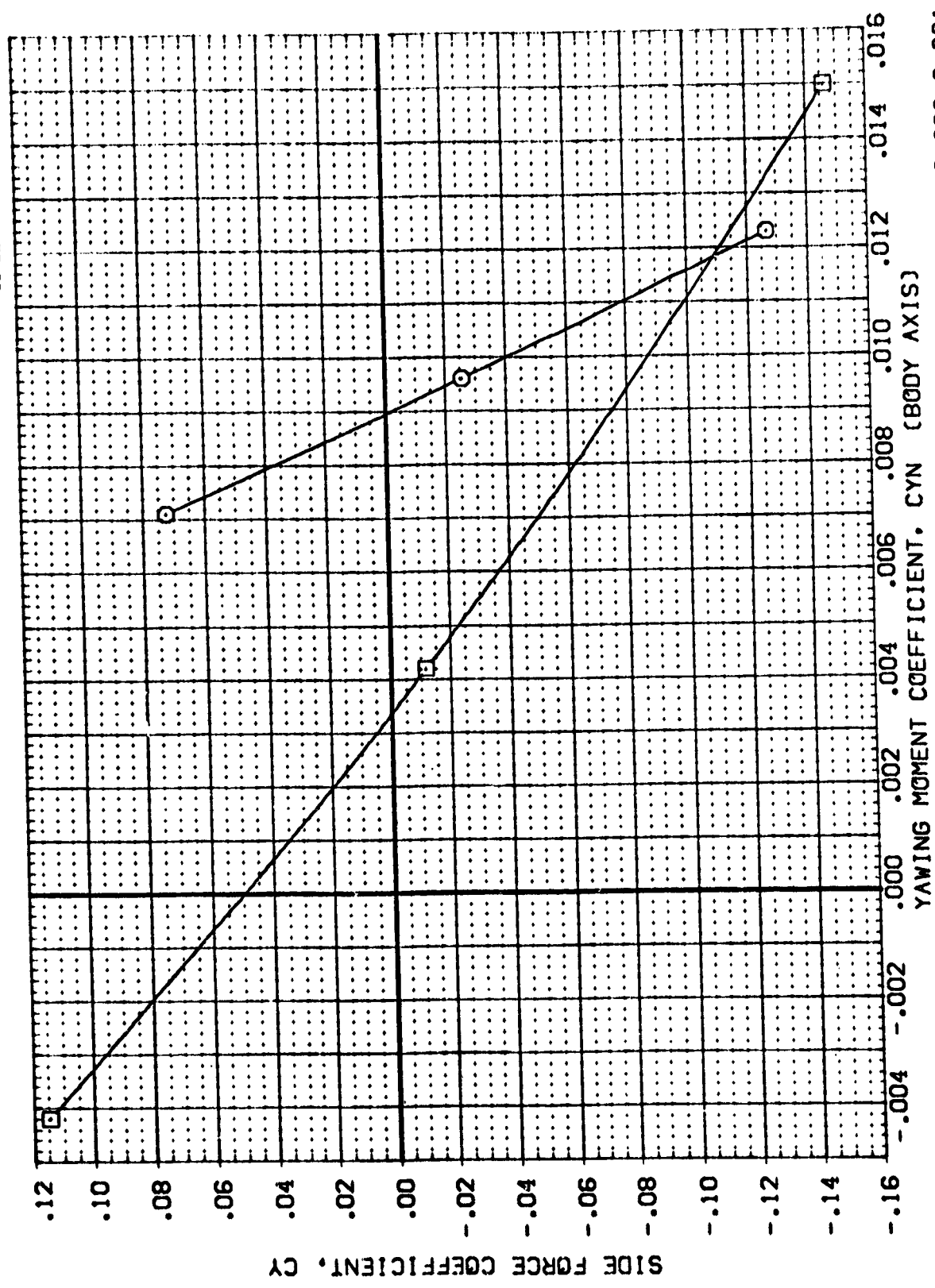


FIG.44 ORBITER LAT-DIR. DATA AT ALPHA=-10 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901
 PAGE 366



AMES 11-7C7 GA12 02A

(ABP041)

| SYMBOL | MACH | PARAMETRIC VALUES | | REFERENCE INFORMATION | |
|--------|------|-------------------|--------|-----------------------|---------|
| | | ALPHA | ELEVON | SREF | SC.FT. |
| ○ | .500 | -4.000 | .000 | LBREF | 38.8490 |
| □ | .901 | -10.000 | .000 | BRREF | 38.8490 |
| | | | | VMREF | 32.3000 |
| | | | | VMREF | 1.0000 |
| | | | | ZREF | .0000 |
| | | | | ZREF | .0000 |
| | | | | SCALE | .0000 |

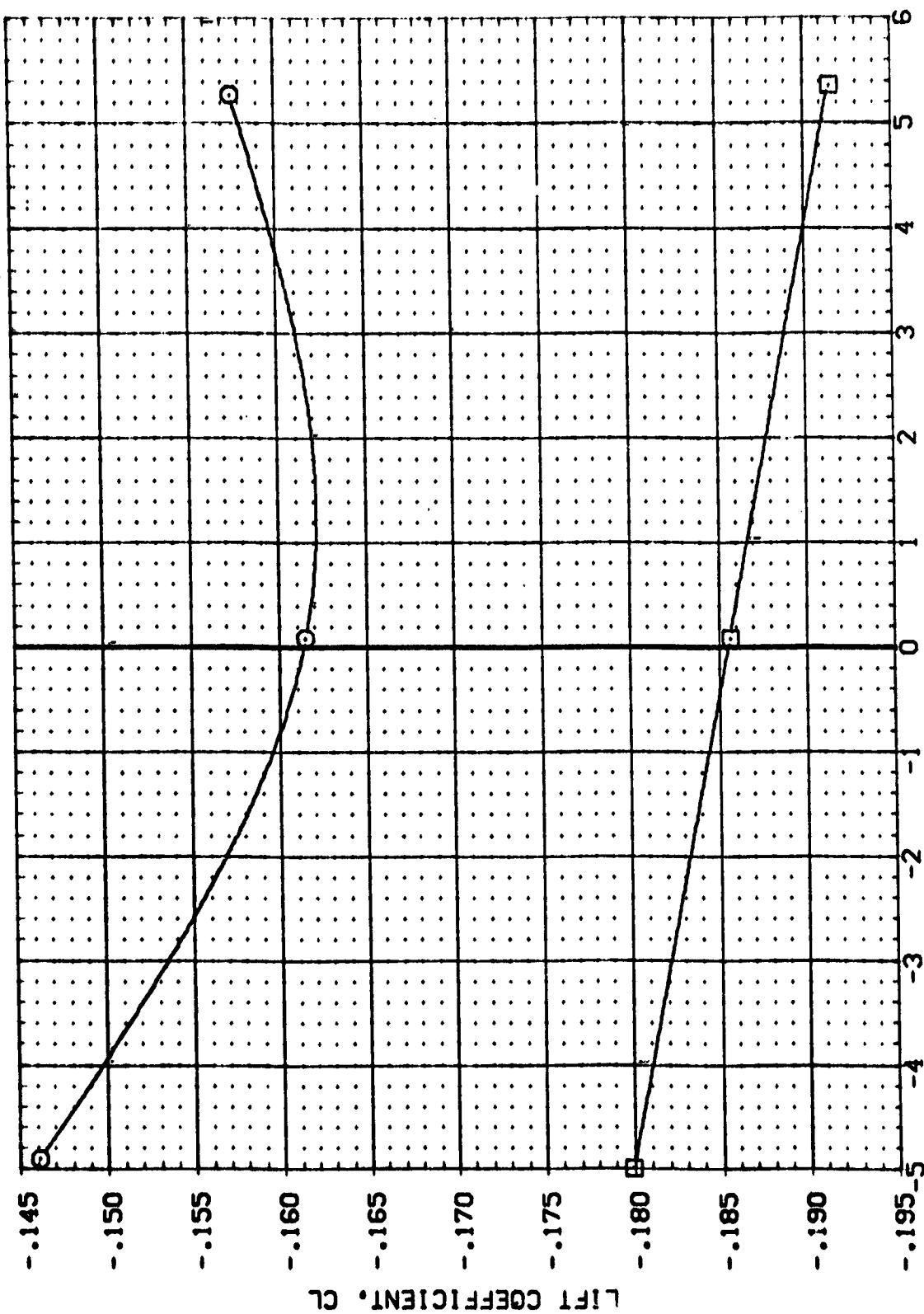


FIG.4.4 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-10 DEGS., MN=0.600,0.901

(RBP042)

AMES 11-707 0A12 02A

| SYMBOL | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | VALUES |
|--------|------|-------|--------|-------------------|--------|--------|--------|
| ○ | .596 | | | -4.000 | .000 | | .000 |
| □ | .901 | | | -20.000 | .000 | | .000 |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.845C
BREF 39.845C
XREF 32.300C
YREF 32.300C
ZREF 32.300C
SCALE .0300

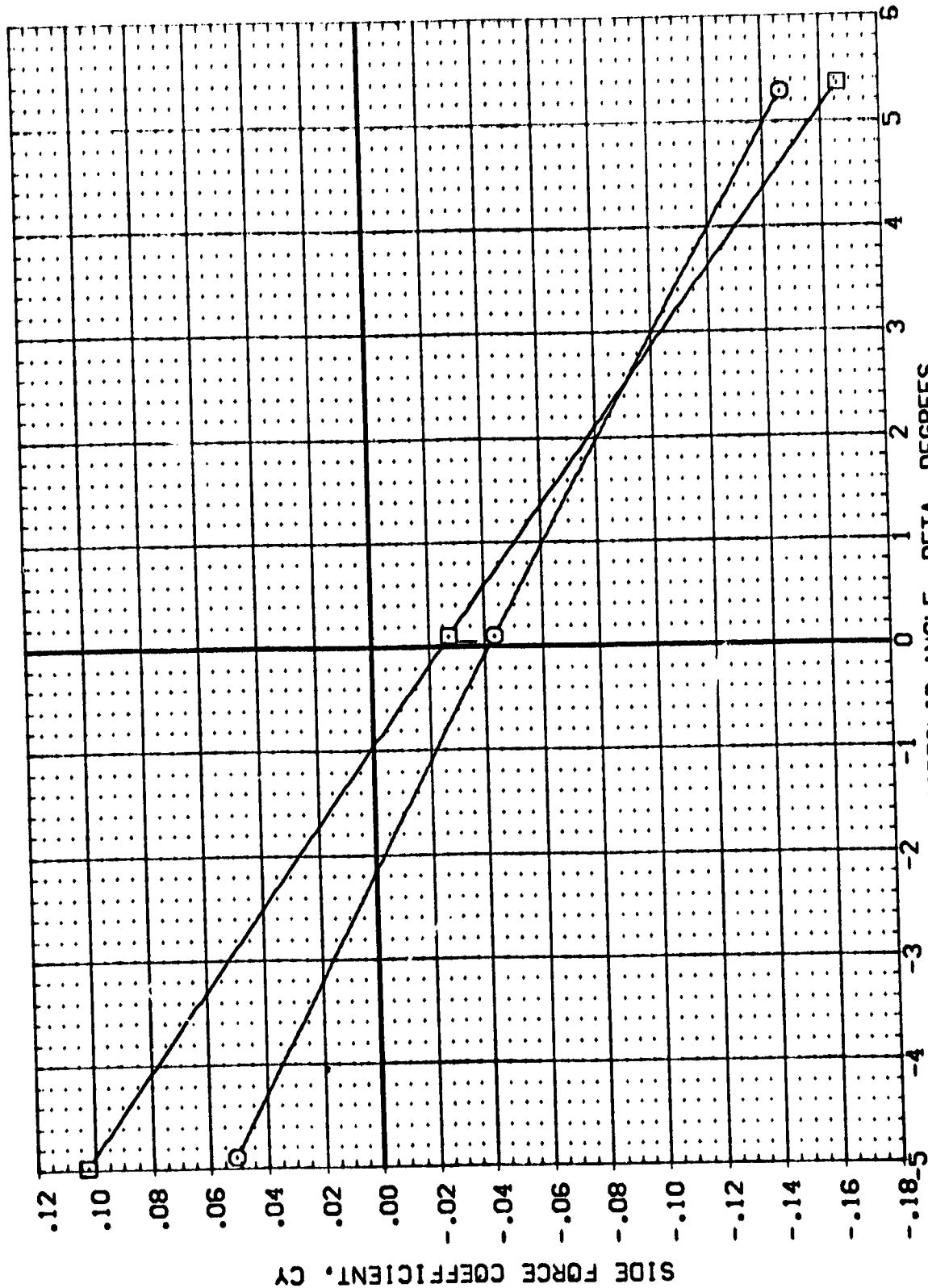


FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

AMES 11-707 0A12 02A

(RBP042)

SYMBOL: \square \circ \square \circ

PARAMETRIC VALUES: \square \circ \square \circ

ACH: .596 ALPHA: -4.000 ELEVON: .000

.501 RUDDER: -20.000 RUDDER: .000

REFERENCE INFORMATION

SREF: 2.4210 SC.FT.

LREF: 39.8450

BREF: 39.8450

XMRP: 32.3000

YMRP: .0000

ZMRP: .0000

SCALE: .0300

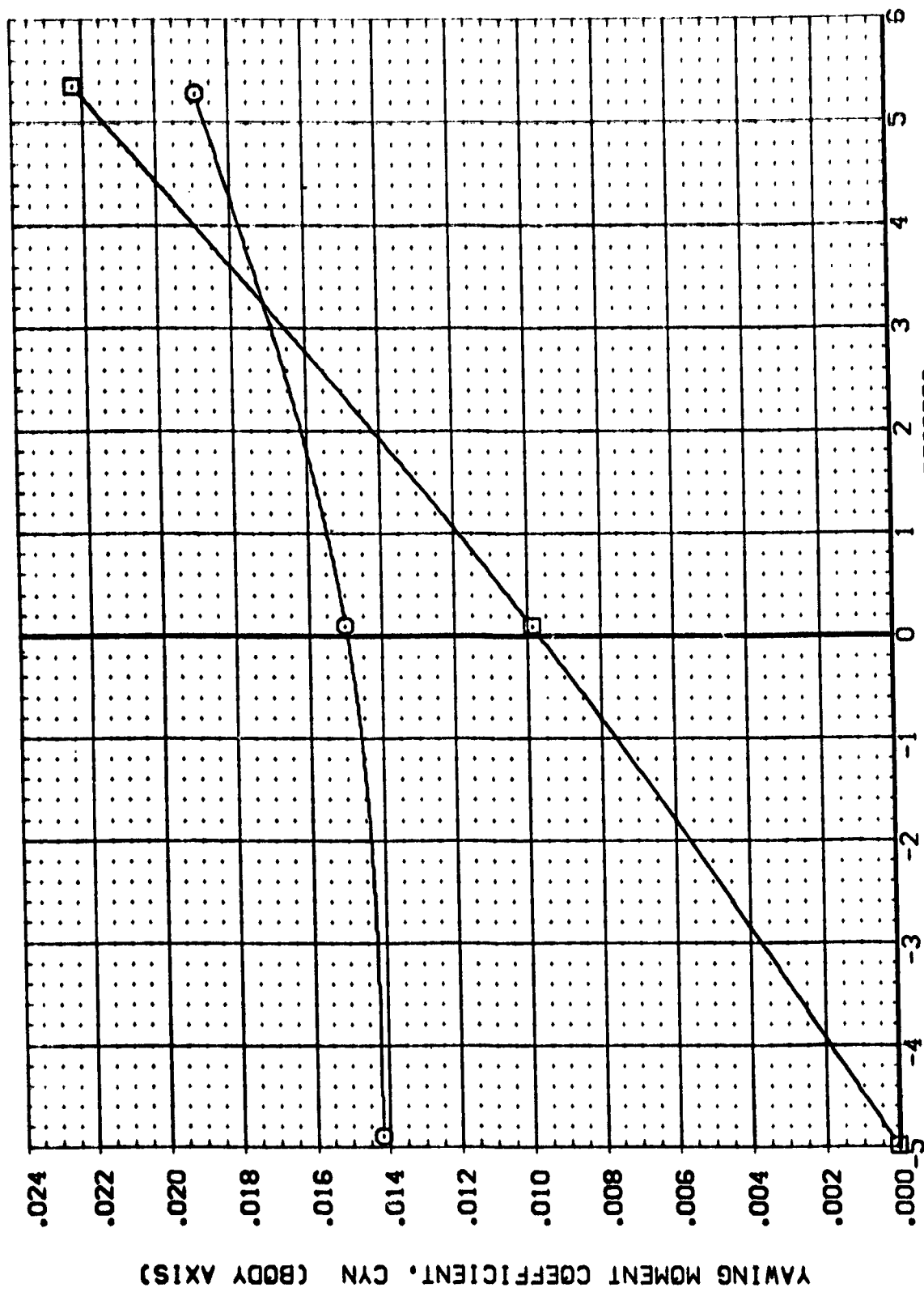


FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

(RBPO42)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
 SREF 2.4213
 LREF 35.8450
 BREF 35.8450
 XGRP 32.3000
 YGRP 32.3000
 ZGRP 32.3000
 SCALE 1.0000

SYMBOL MACH ALPHA RUDDER
 ○ .596 .901
 □ .000 .000

PARAMETRIC VALUES
 -4.000 ELEVON
 -20.000 RUDDLR

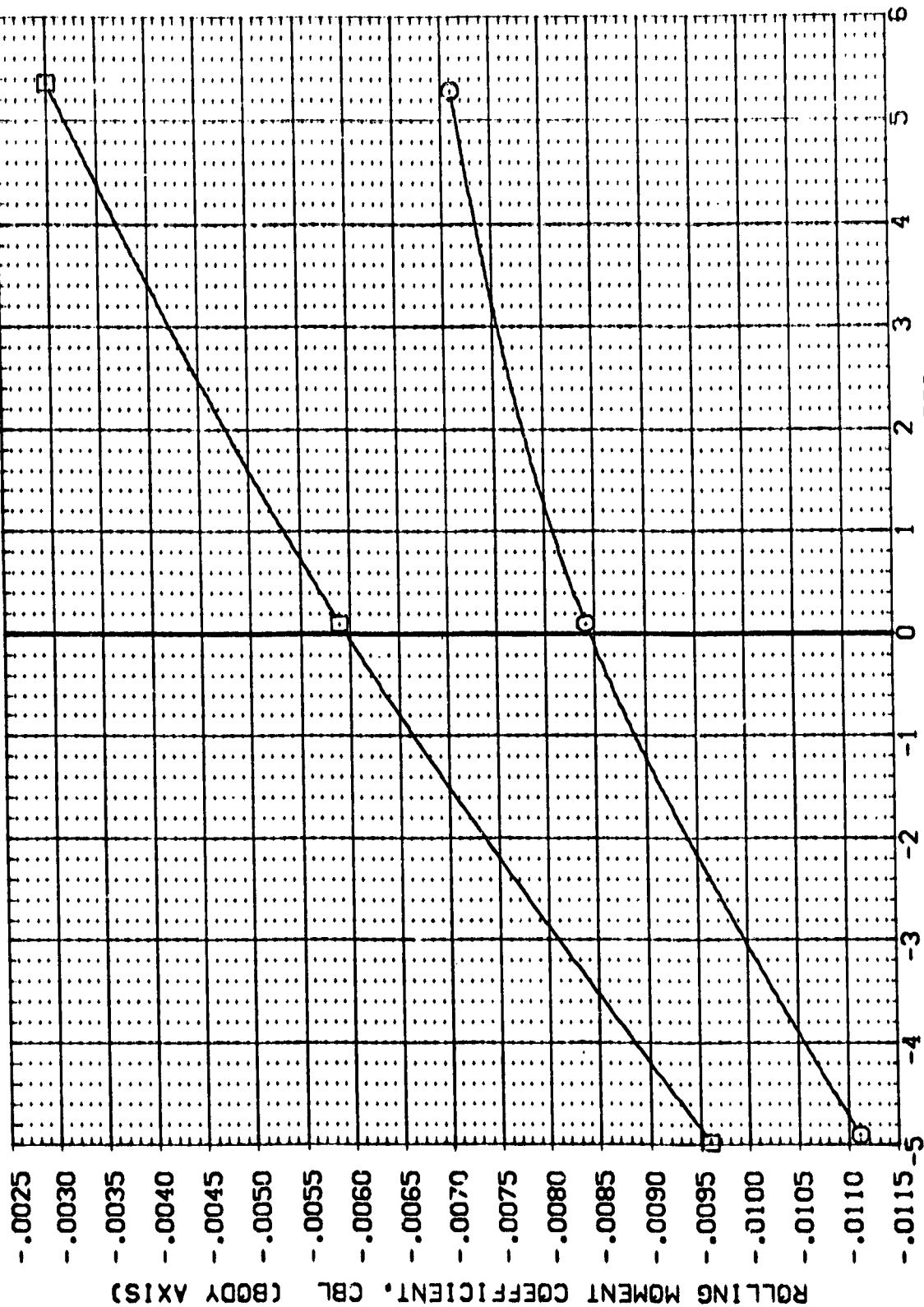


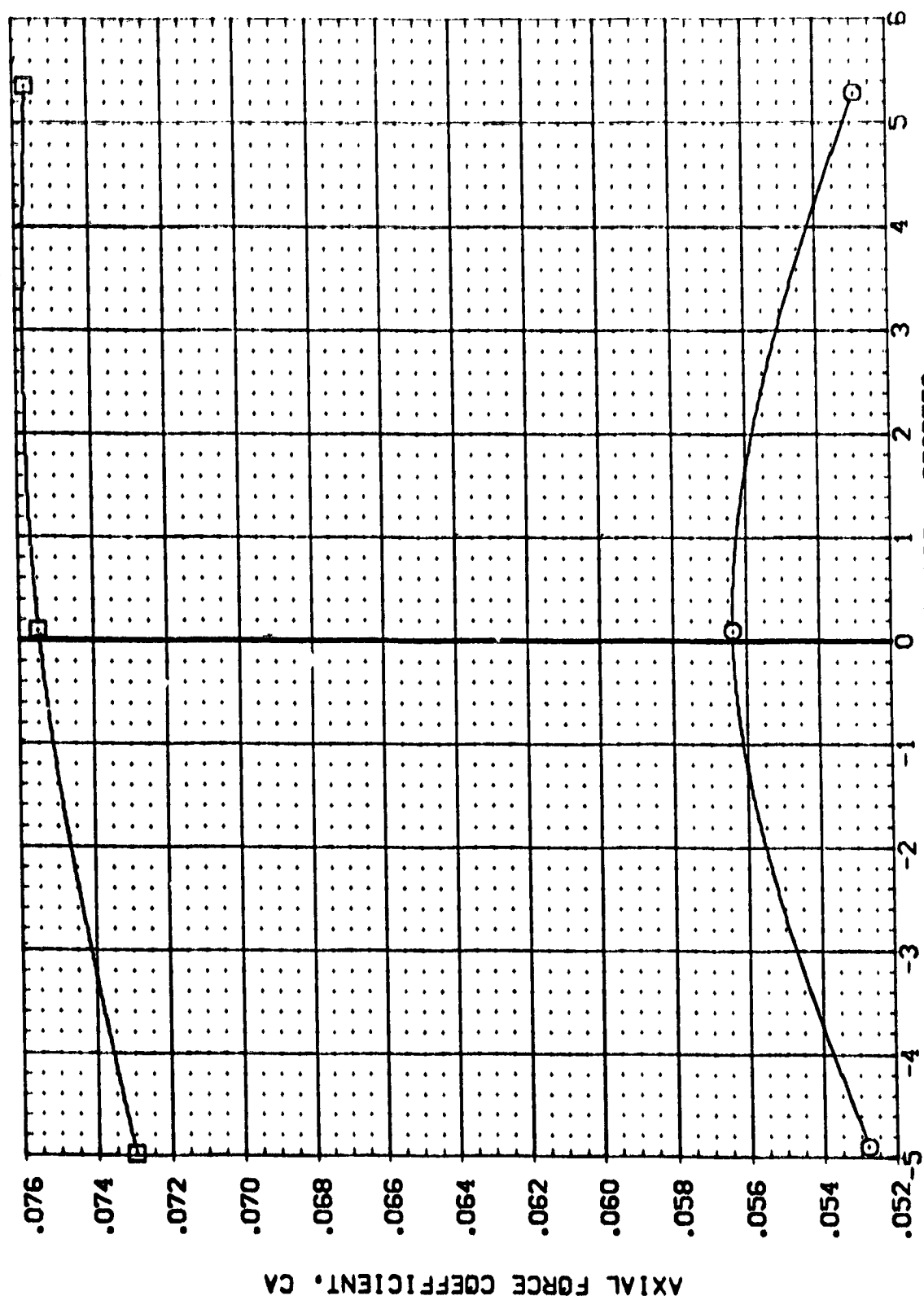
FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

AMES 11-707 3A12 02A

(RBP042)

SYMBOL MACH .95 .901
 □
 PARAMETRIC VALUES
 ALPHA -4.000 ELEVON .000
 RUDDER -20.000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.421D SC.F.T.
 LREF 38.845C
 BREF 38.845C
 XGRP 32.3000
 YGRP .0000
 ZGRP .0000
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

(RBP042)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER ELEVON ROLFLR
 □ .596 .901 -4.000 -20.000 .000 .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 1.0000
 ZREF 1.0000
 SCALE .0000

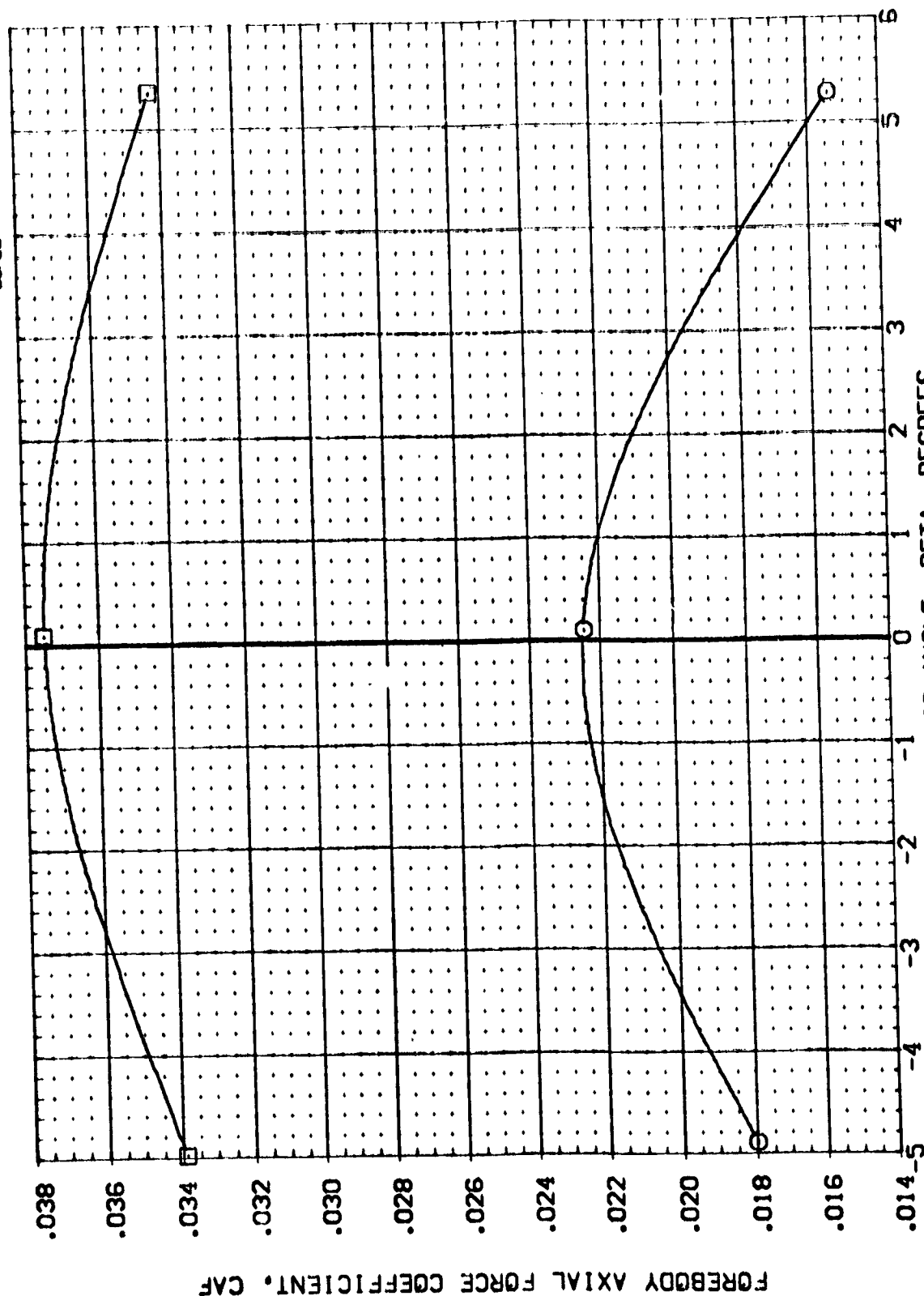


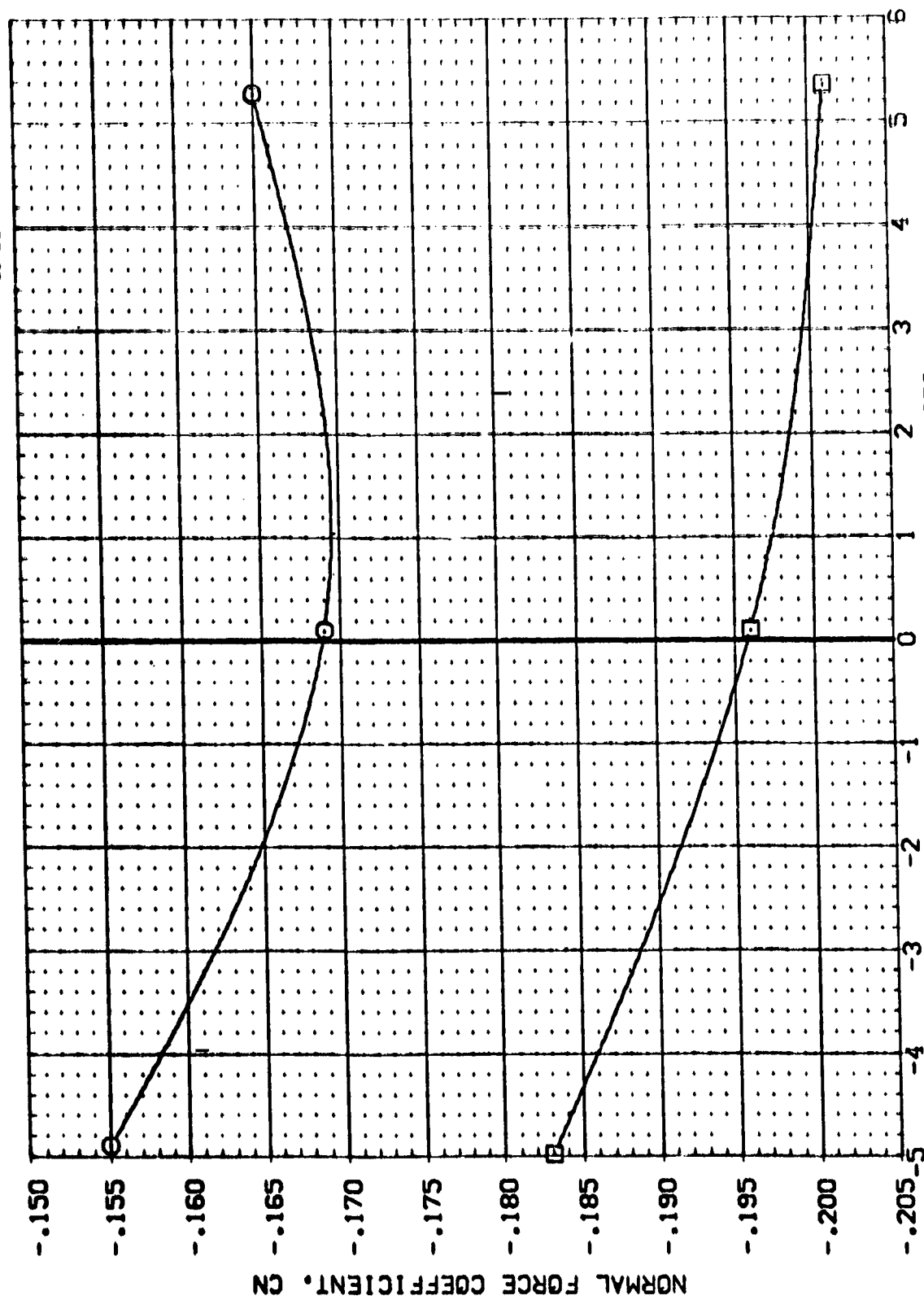
FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901
 PAGE 372

(RBP042)

AMES 11-707 0A12 02A

SYMBOL MACH .596 ALPHA .000 ELEVON .000
SC1 RUDDER -20.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4212 SQ.FT.
REF 39.815
EREF 39.815
XREF 32
YREF 32
ZREF 32
SCALE 1:30



SIDESLIP ANGLE, BETA, DEGREES

FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., VN=0.596, 0.901

(R8P042)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
□ .595 ALPHA -4.000 ELEVON .000
□ .901 RUDDER -20.000 RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210 52.5°
LREF 36.3450
SREF 36.8450
XREF 32.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.0000

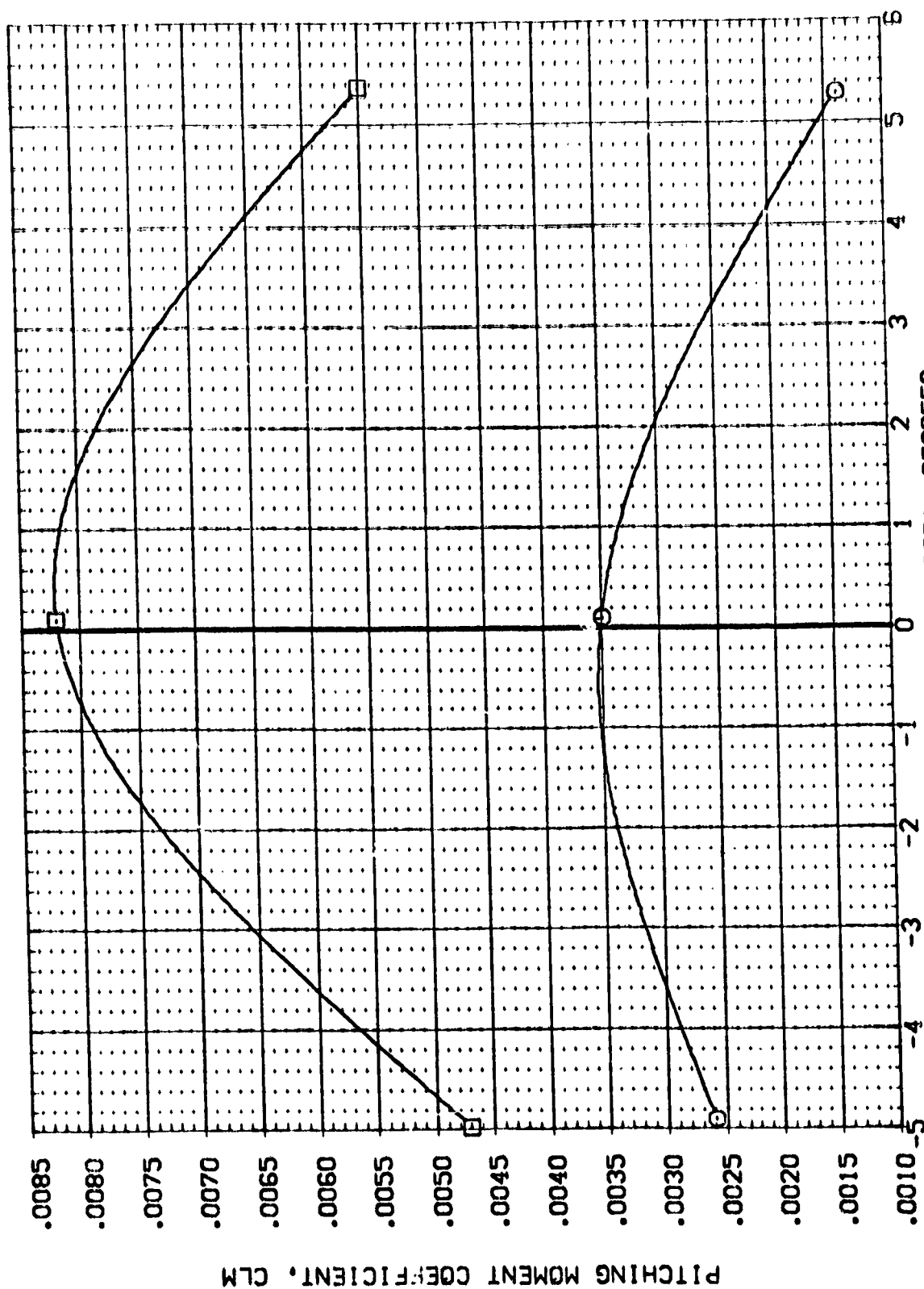


FIG.45 ORBITER LAT-DIR: DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.595, 0.901

(RBPO42)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
□ .596 .901 -4.000 ELEVON .000
□ -20.000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.5000
YMRP .0000
ZMRP .0000
SCALE .0300

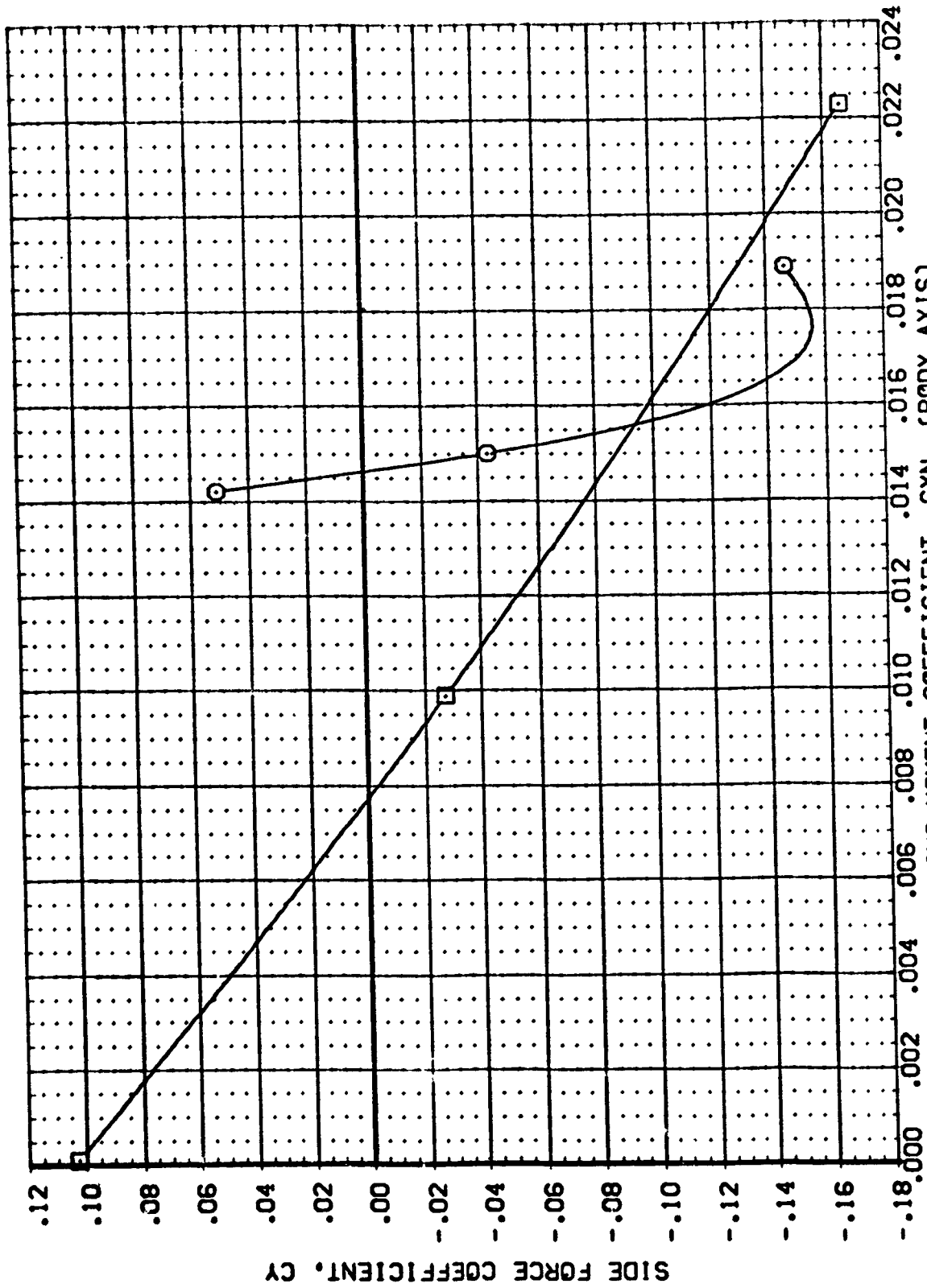


FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

(ABP042)

AMES 11-707 OA12 02A

SYMBOL
○ □

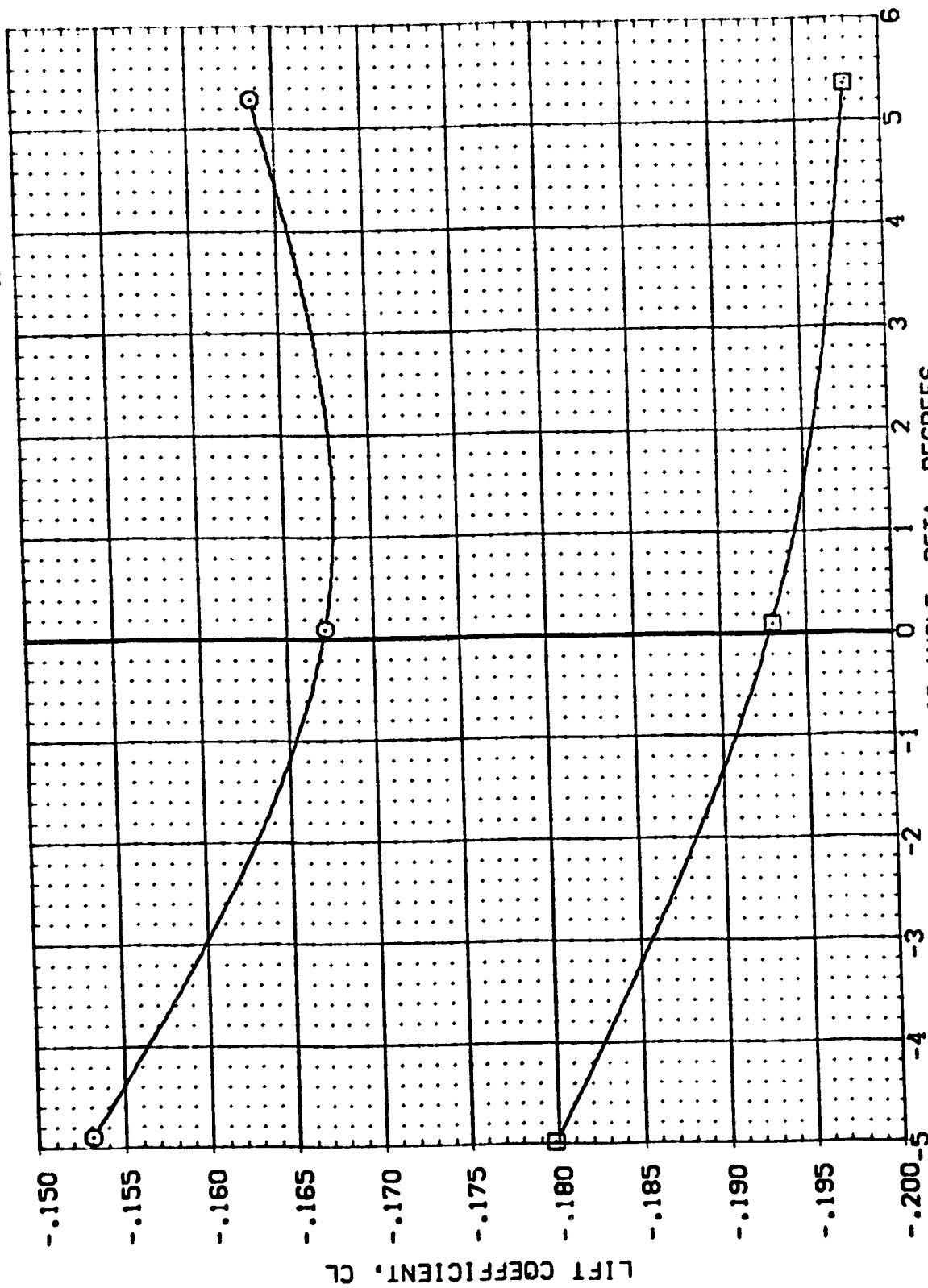
MACH
.596
.901

ALPHA
RUDDER

PARAMETRIC VALUES
-4.000 ELEVON
-20.000 RUDDER

.000
.000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDSLIP ANGLE, BETA, DEGREES

FIG.45 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., RUDDER=-20 DEGS., MN=0.596, 0.901

(RBP043)

AMES 11-707 0A12 02A

SYMBOL
□

MACH
.600
.903

ALPHA
RUDDER

PARAMETRIC VALUES
-4.000
.000

ELEVON
RUDFLR

10.000
.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

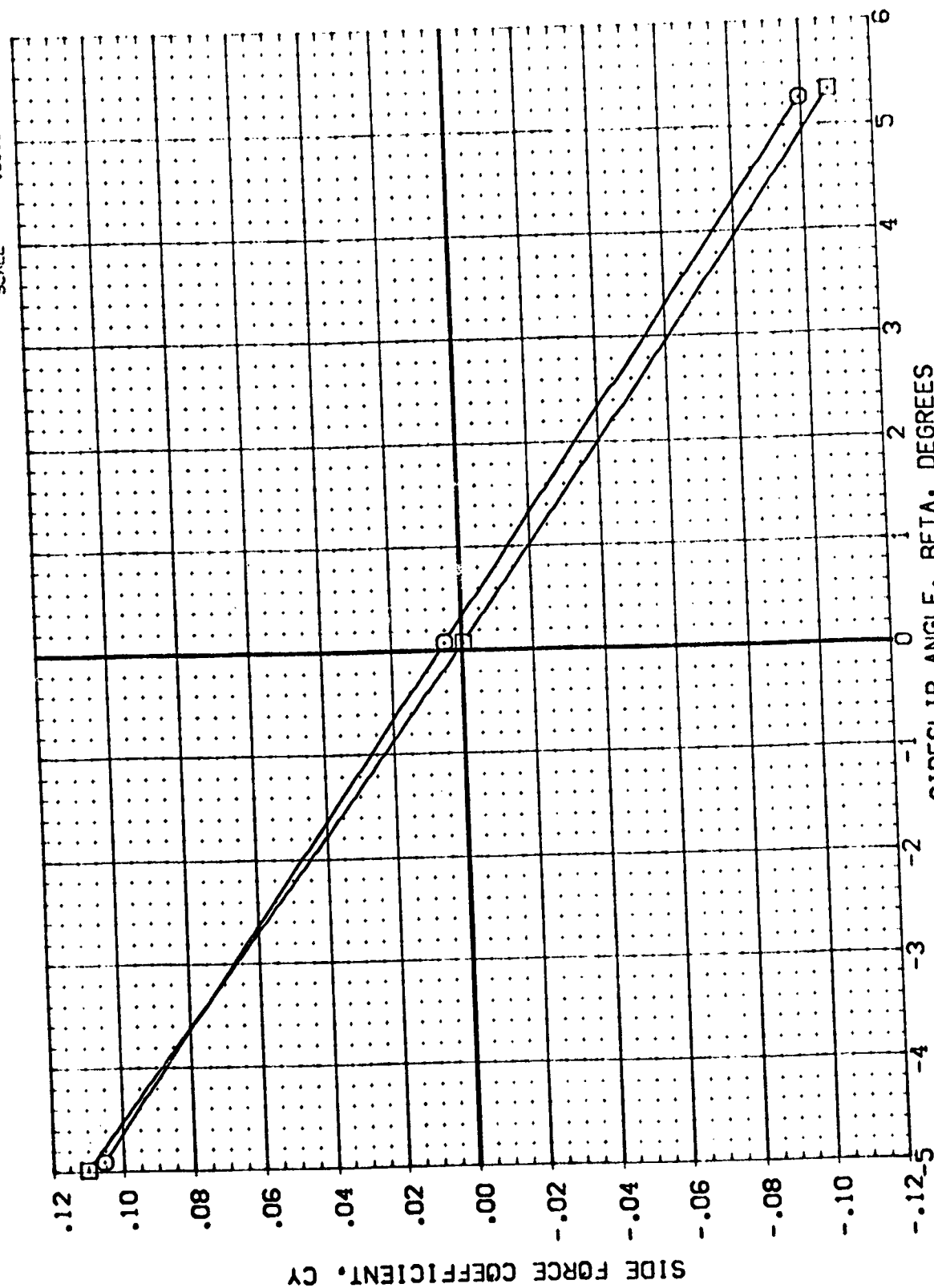


FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600, 0.903

(RBP043)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDFLR
O .500 .903 -4.000 .000 10.000 .000

REFERENCE INFORMATION
SREF 2.4210 SC.F.
LREF 38.8480
BREF 38.8480
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

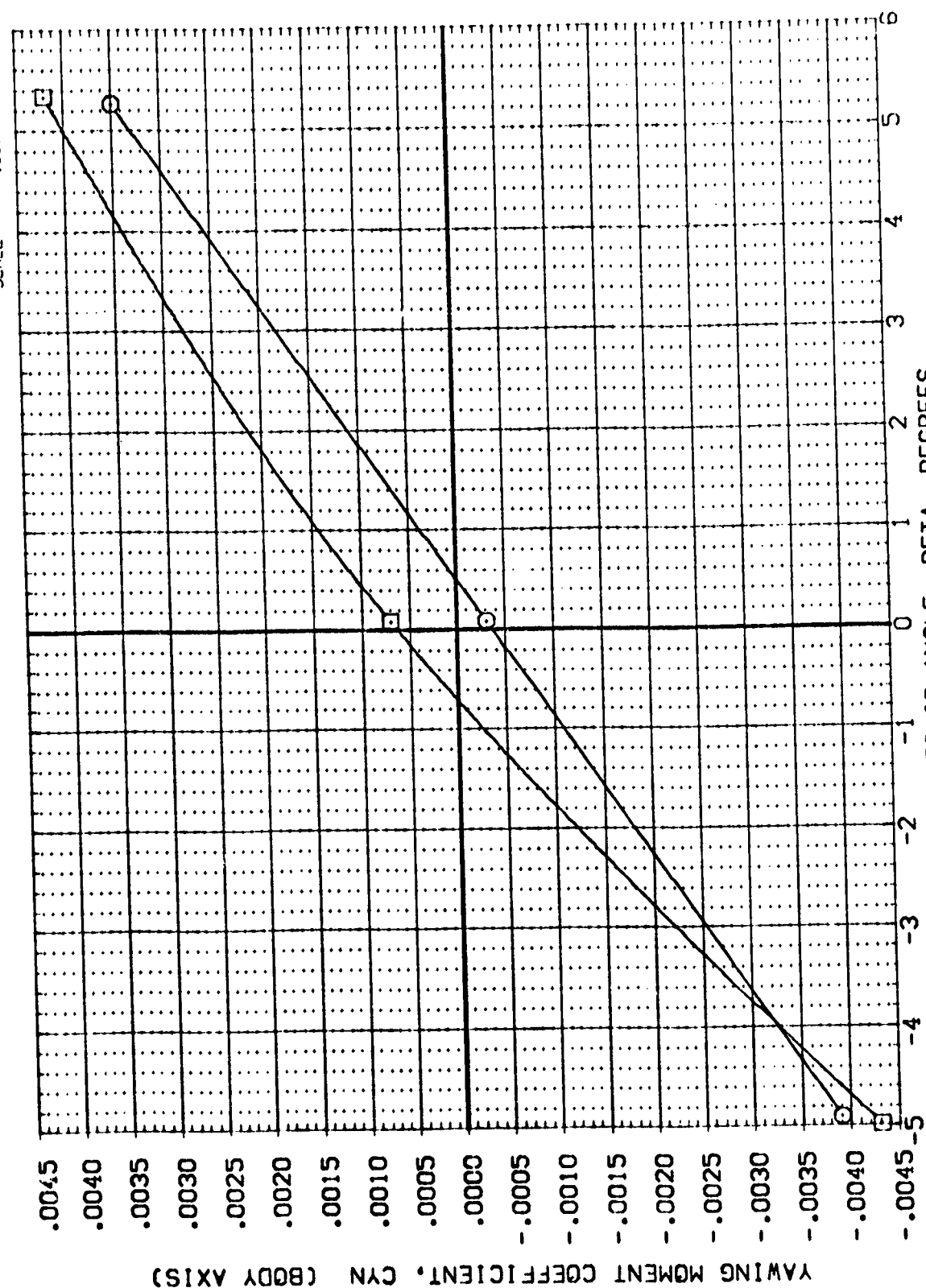
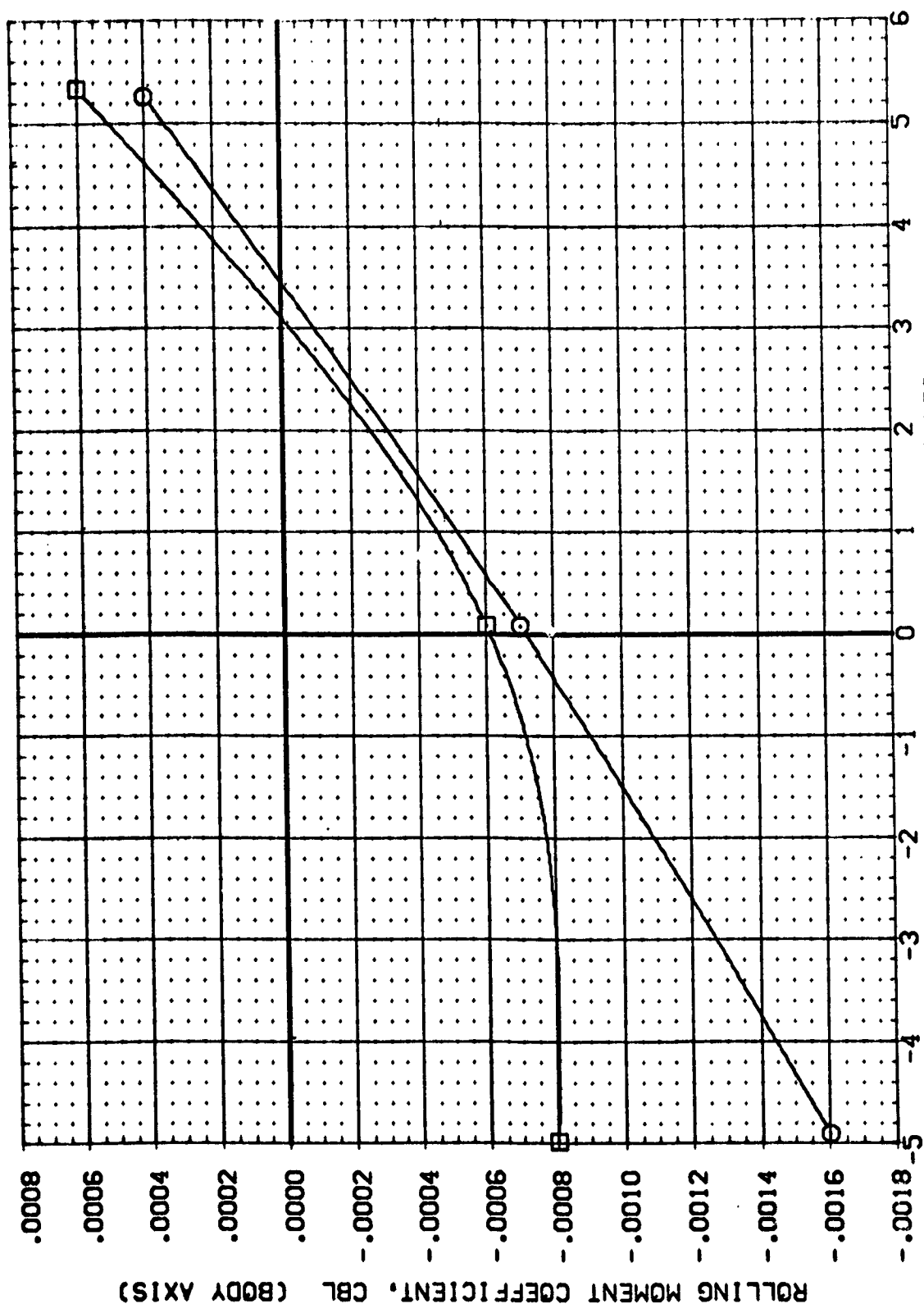


FIG.46 ORBITER LAT-OIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600, 0.903

AMES 11-707 0A12 02A

(RBP043)

| | | | | | | | |
|--------|------|--------|-------|-------------------|--------|-----------------------|---------|
| SYMBOL | MACH | ALPHA | RUDER | PARAMETRIC VALUES | | REFERENCE INFORMATION | |
| ○ | .600 | -4.000 | .000 | ELEVON | 10.000 | SREF | 2.4210 |
| □ | .903 | .000 | .000 | RUDFLR | .000 | LREF | 39.8490 |
| | | | | | | BREF | 39.8490 |
| | | | | | | XMRP | 32.3000 |
| | | | | | | YMRP | .0000 |
| | | | | | | ZMRP | .0000 |
| | | | | | | SCALE | .0300 |



SIDESLIP ANGLE, BETA, DEGREES

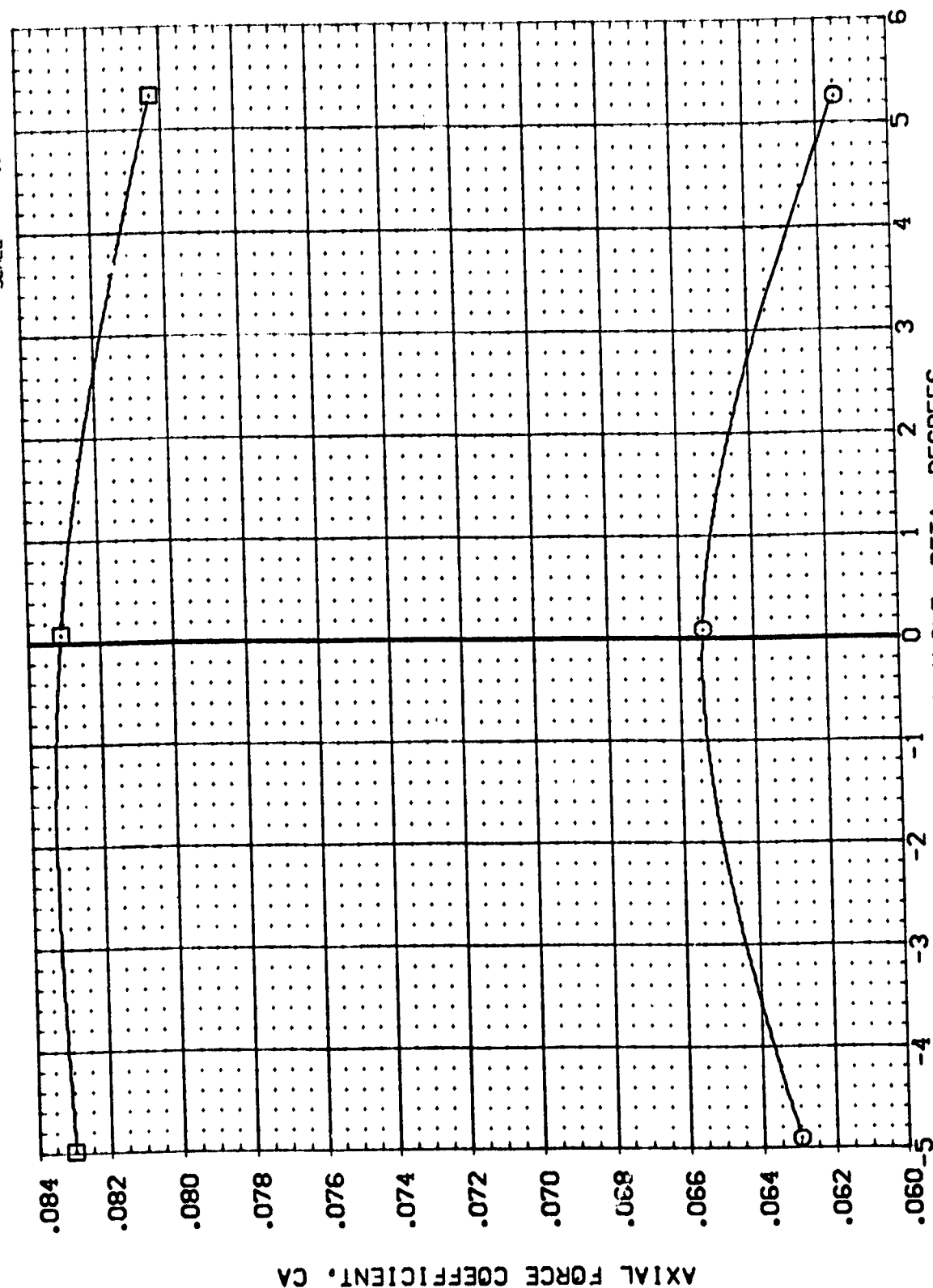
FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600,0.903

(RBP043)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDELR SCALE

REFERENCE INFORMATION SC.FT. SREF 2.4210 LREF 38.8450 BREF 38.8450 XMRP 32.3000 YMRP .0000 ZMRP .0000 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600,0.903

==

AMES 11-707 0A12 02A

(RBP043)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER 10.000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8490 IN.
XMP 32.3000 IN.
YMP .0000 IN.
ZMP .0000 IN.
SCALE .0300 SCALE

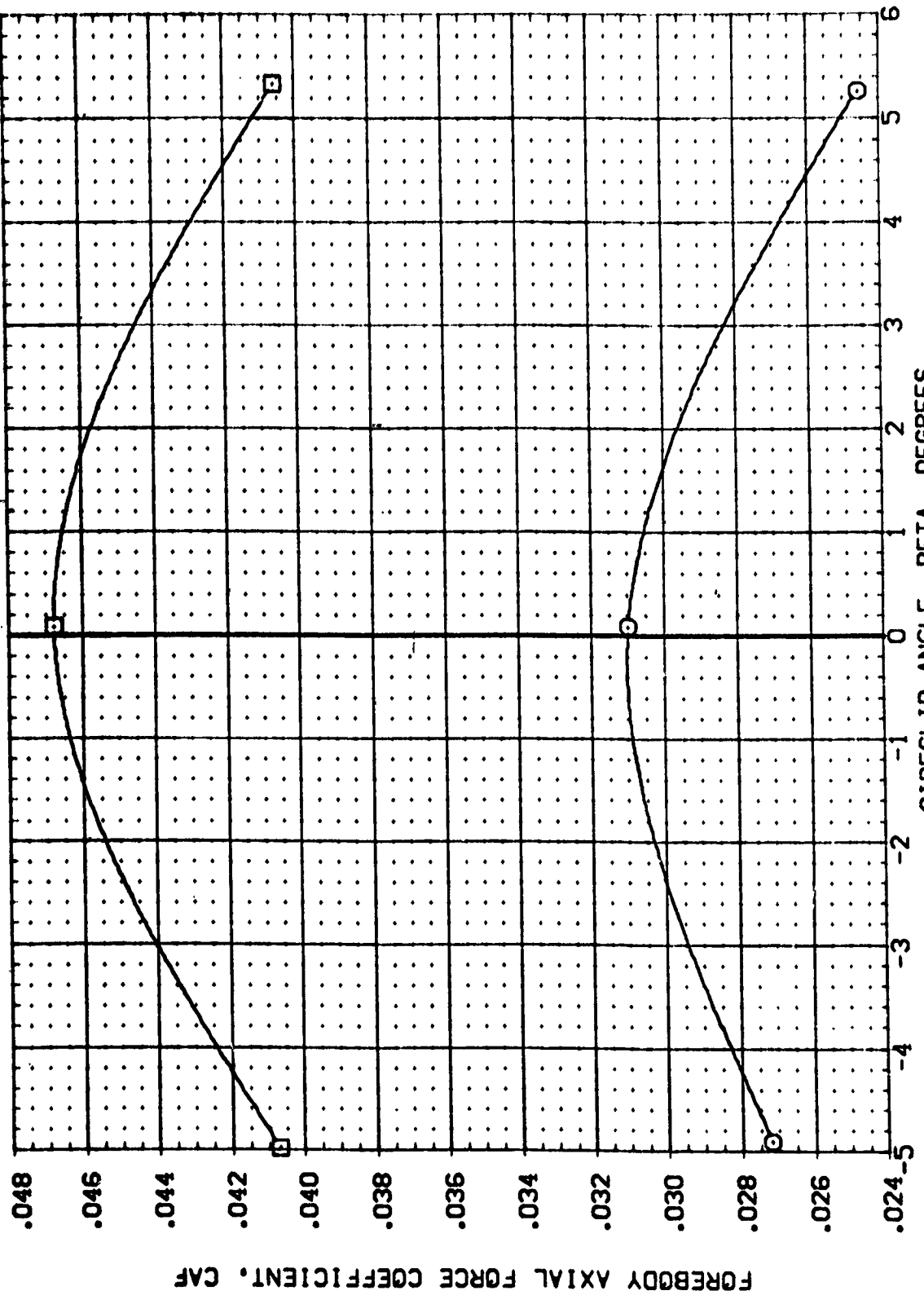


FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600,0.903

(RBP043)

AMES 11-707 0A12 02A

| | | | | | | |
|--------|------|-------|-------------------|--------|--------|-------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDDER | SCALE |
| ○ | .600 | .000 | -4.000 | 10.000 | .000 | |
| □ | .903 | .000 | .000 | .000 | .000 | |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SO.FT. |
| LREF | 38.8490 | IN. |
| BREF | 38.8490 | IN. |
| XGRP | 32.5000 | IN. |
| YGRP | .0000 | IN. |
| ZGRP | .0000 | IN. |
| SCALE | .0300 | SCALE |

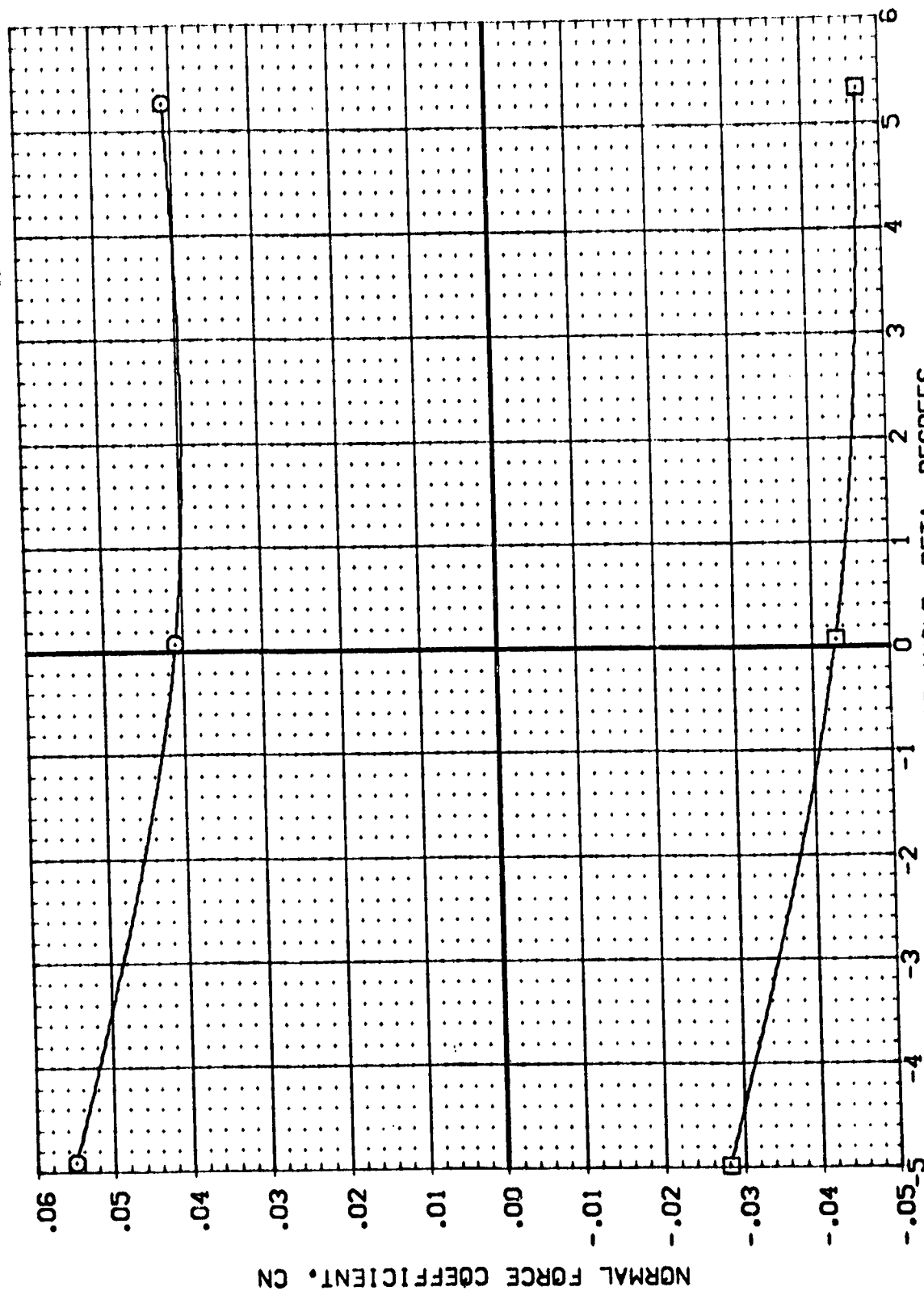


FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600,0.903

AMES 11-707 0A12 02A

(RBP043)

| | | | | | | |
|--------|------|-------|-------------------|--------|---------|--------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDEFLR | 10.000 |
| □ | .600 | .903 | -4.000 | .000 | .000 | .000 |
| □ | | | | | | |

| | |
|-----------------------|---------|
| REFERENCE INFORMATION | |
| SREF | 2.421C |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0300 |

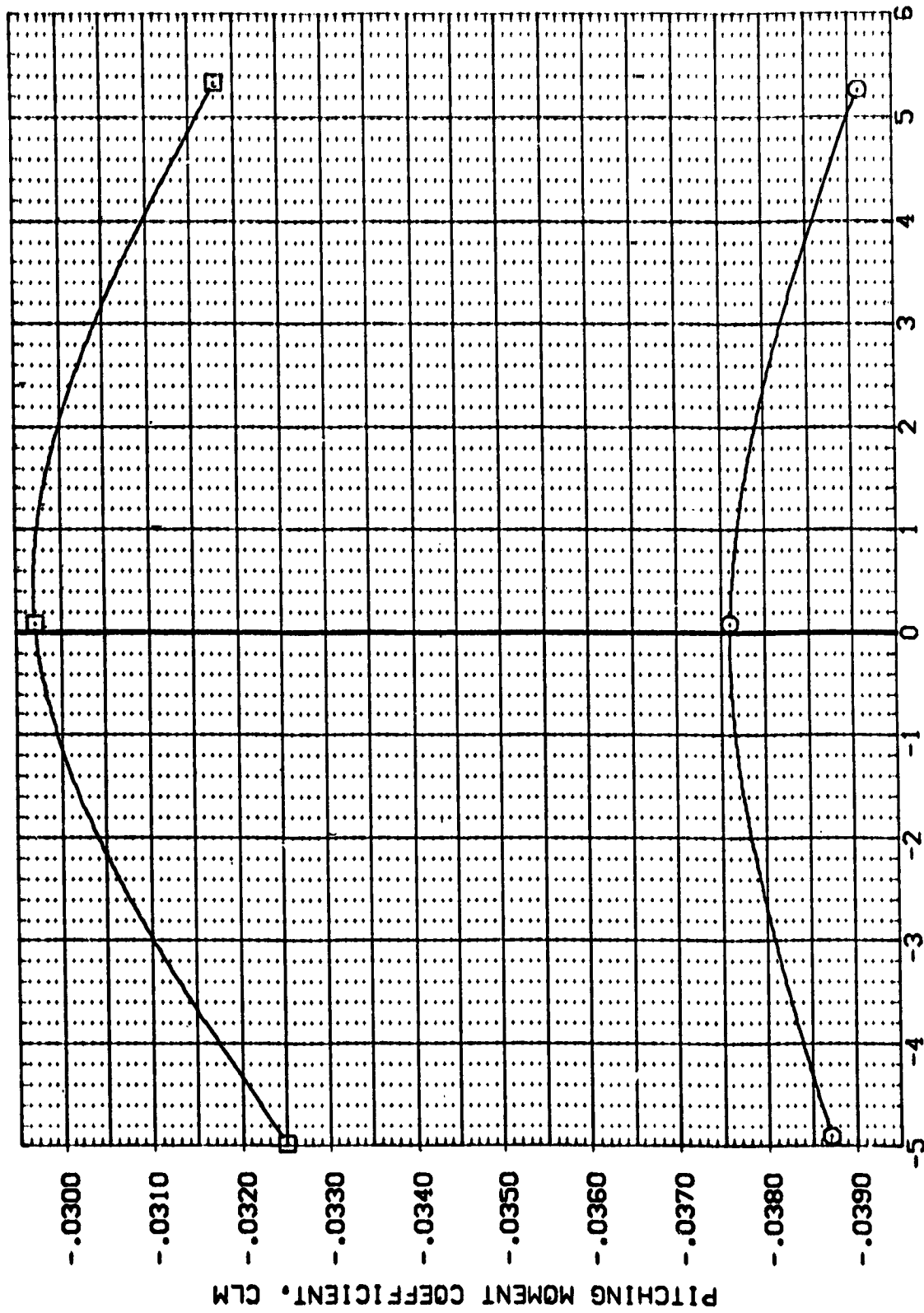


FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600, 0.903

(RBP043)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8480
 BREF 39.8480
 XREF 32.0000
 YREF 32.0000
 ZREF 32.0000
 SCALE

SYMBOL MACH ALPHA RUDDER
 O .600 .903
 □ .000 .000

PARAMETRIC VALUES
 -4.000 ELEVON 10.000
 .000 RUDDER .000

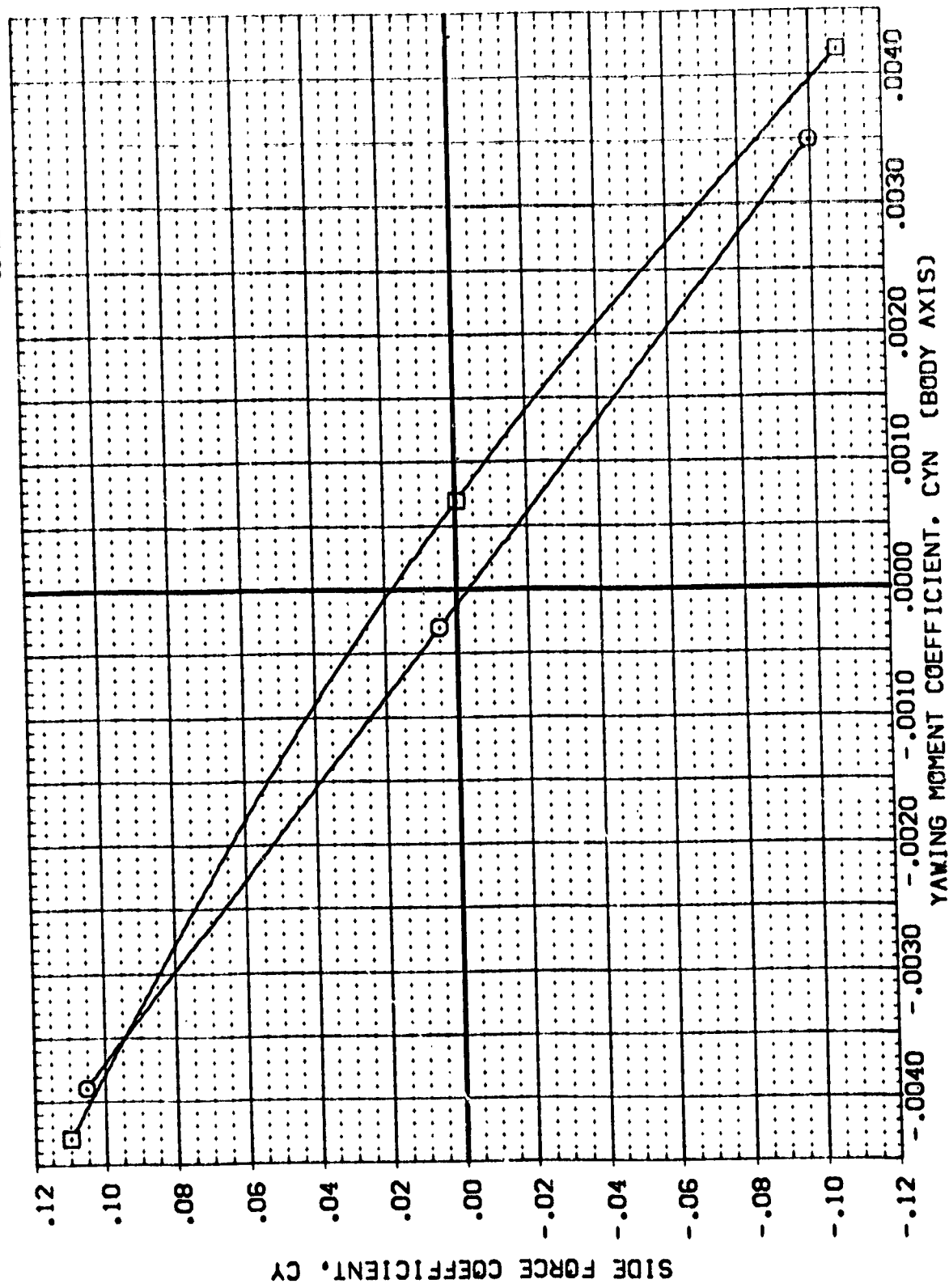


FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600, 0.903

==

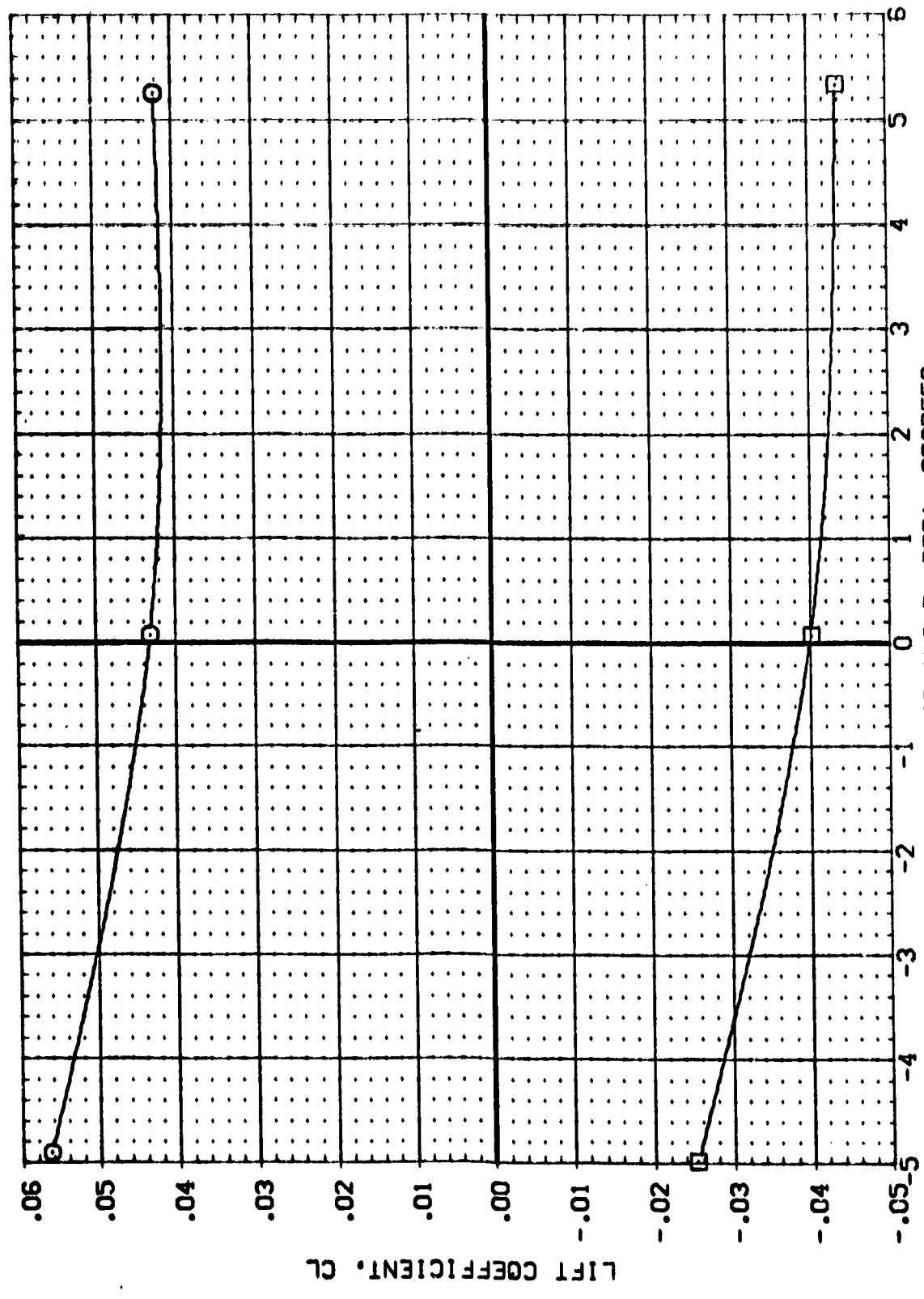
(ABP043)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
 SREF 2.4210
 LREF 30.8480
 BREF 30.8480
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000

SYMBOL MACH ALPHA RUDDER
 O .600 .903
 □ .000 .000

PARAMETRIC VALUES
 -4.000 ELEVON 10.000
 .000 RUOFLR .000



SIDESLIP ANGLE, BETA, DEGREES

FIG.46 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=10 DEGS., MN=0.600,0.903

CRBP0440

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER
 .597
 .904

PARAMETRIC VALUES
 -4.000 ELEVON
 .000 RUDFLR
 -10.000

SYMBOL
 10

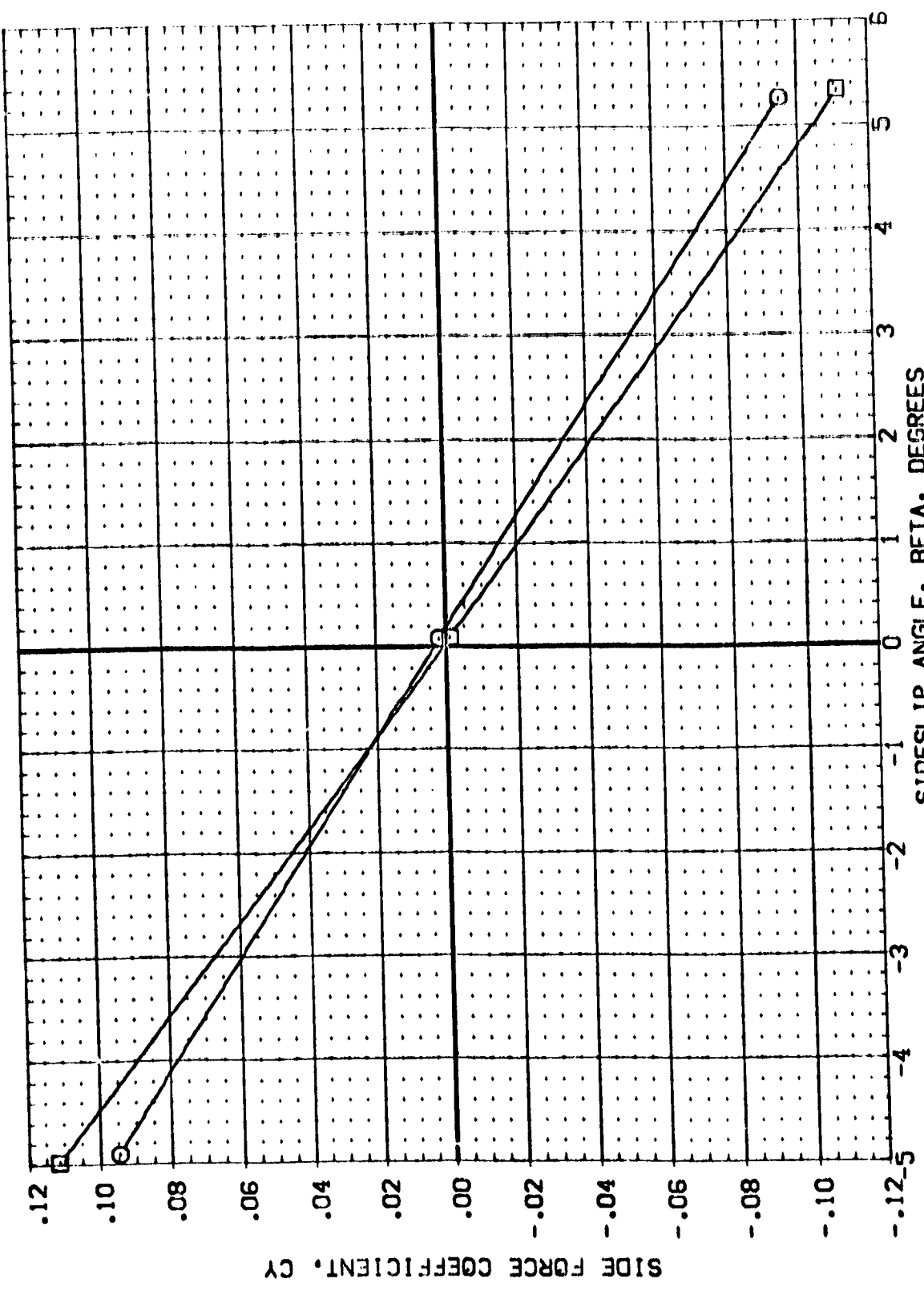


FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904
 PAGE 386

AMES 11-707 0A12 02A

(RBP044)

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES ELEVON RUFLR ELEVON RUFLR

REFERENCE INFORMATION
SHEET 2-4210 SQ. FT.
REF 38 8180
SPEC 38 8180
XREF 32 3000
YREF 32 3000
ZREF 32 3000
SCALE 1:1000

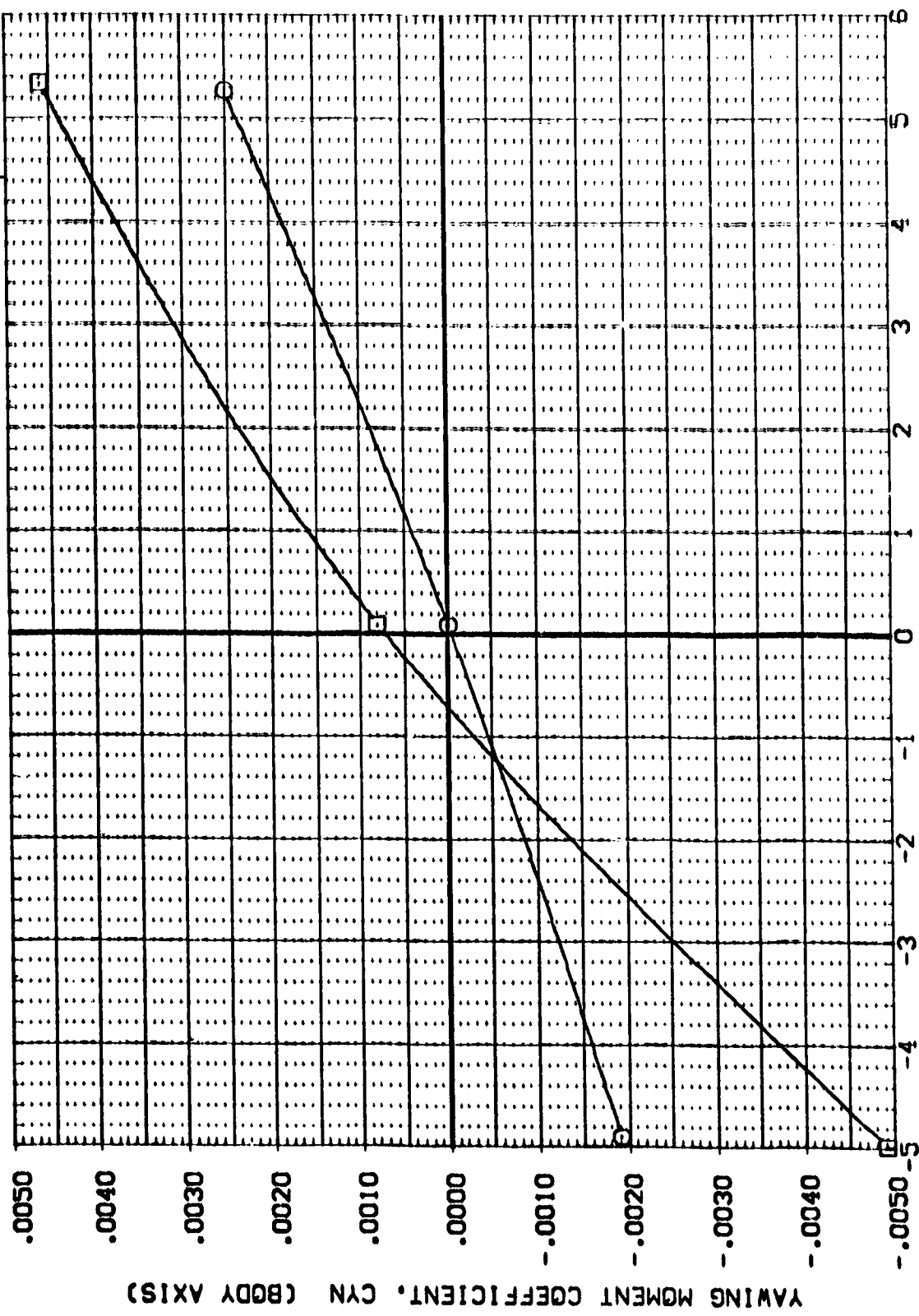


FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

AMES 11-707 GA:2 C2A

| PARAMETRIC VALUES | ALPHA | BETA | RODGER | ALPHA | BETA | RODGER |
|-------------------|-------|------|--------|-------|------|--------|
| -10.000 | .597 | .597 | .597 | .597 | .597 | .597 |
| .000 | .924 | .924 | .924 | .924 | .924 | .924 |

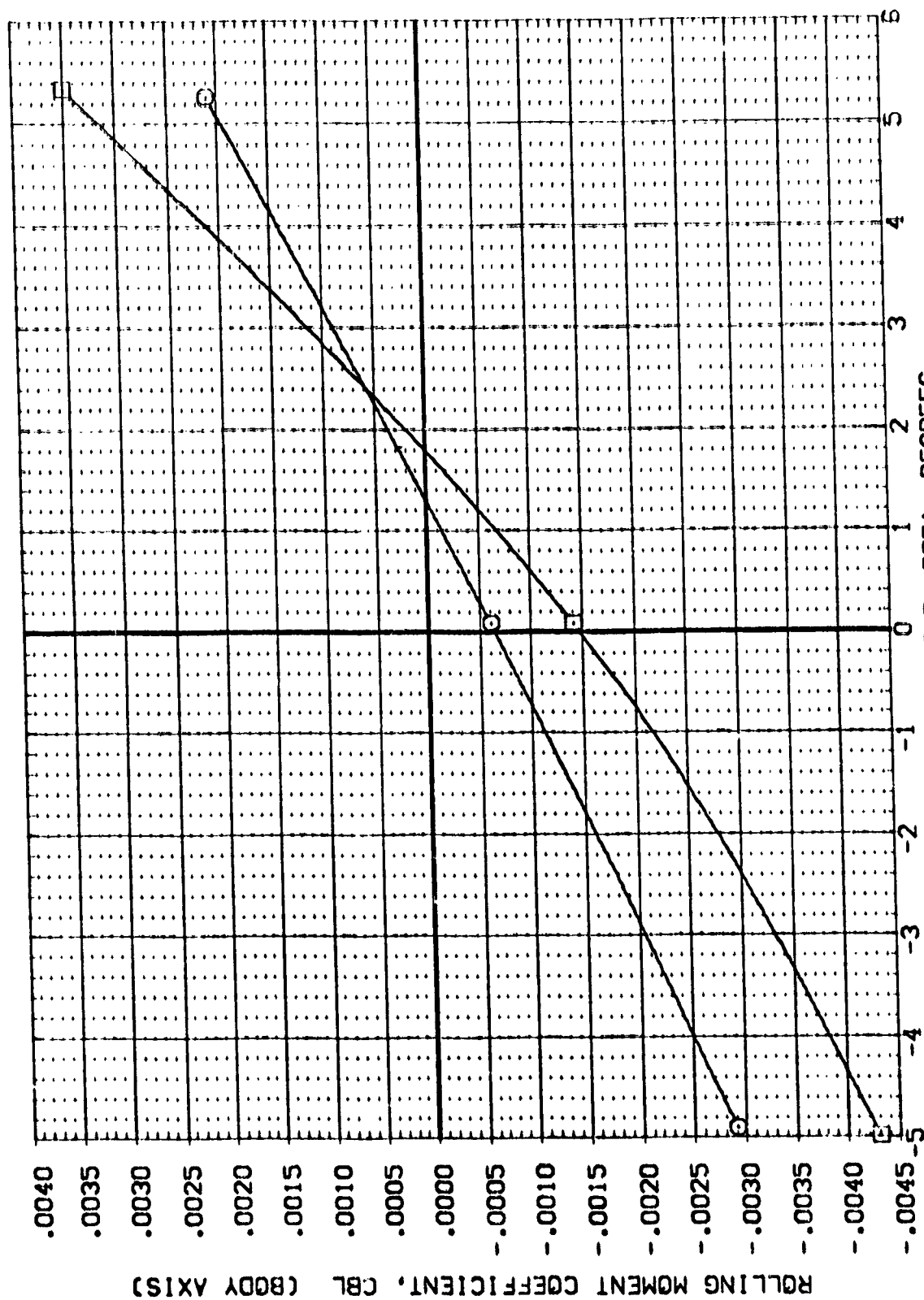
[illegible]

FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

AMES 11-707 0A12 02A

(RBPO44)

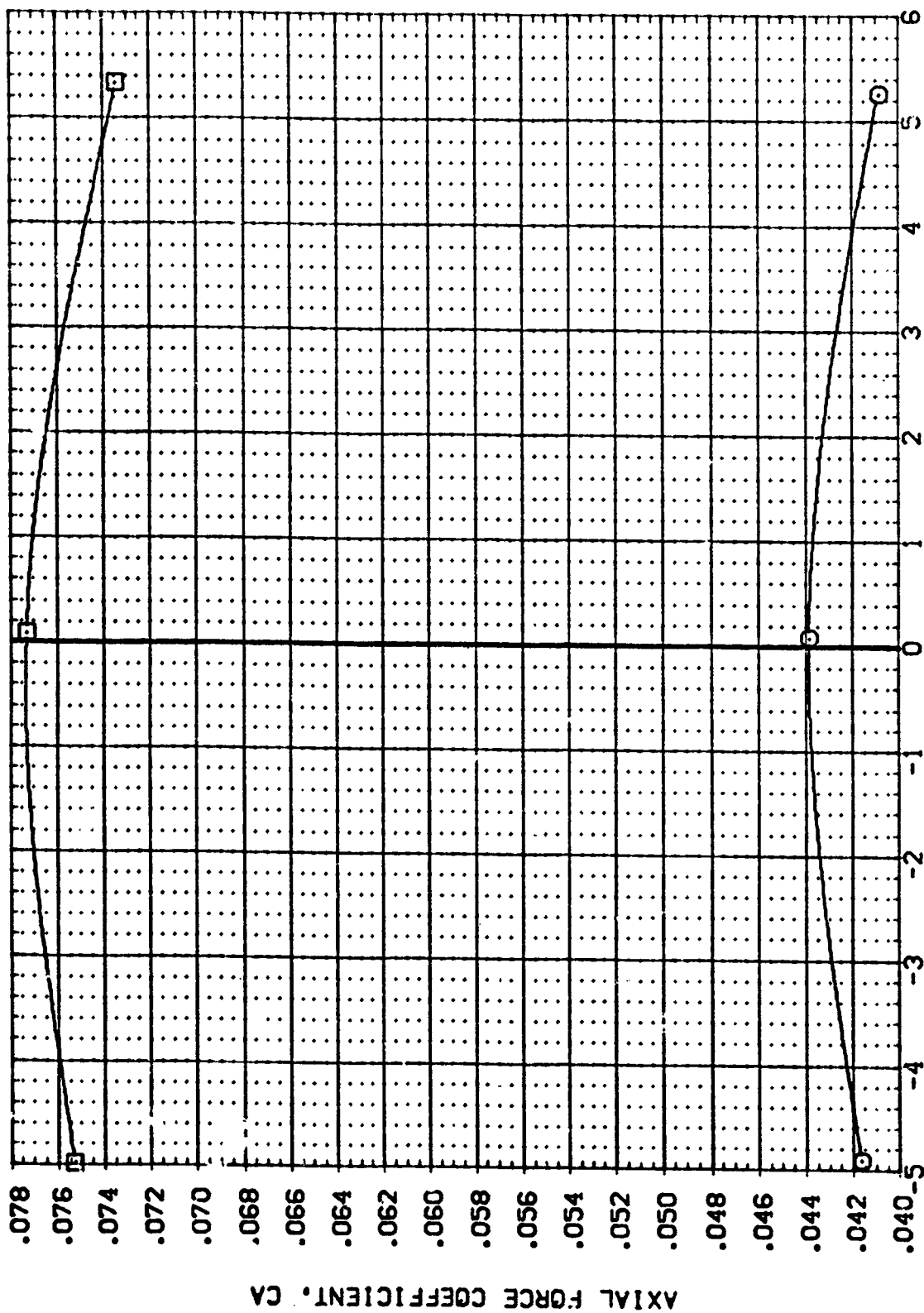
SYMBOL
□

MACH
.597
.904

ALPHA
RUDDER

PARAMETRIC VALUES
-4.000 ELEVON -10.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 38.8490 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597,0.904

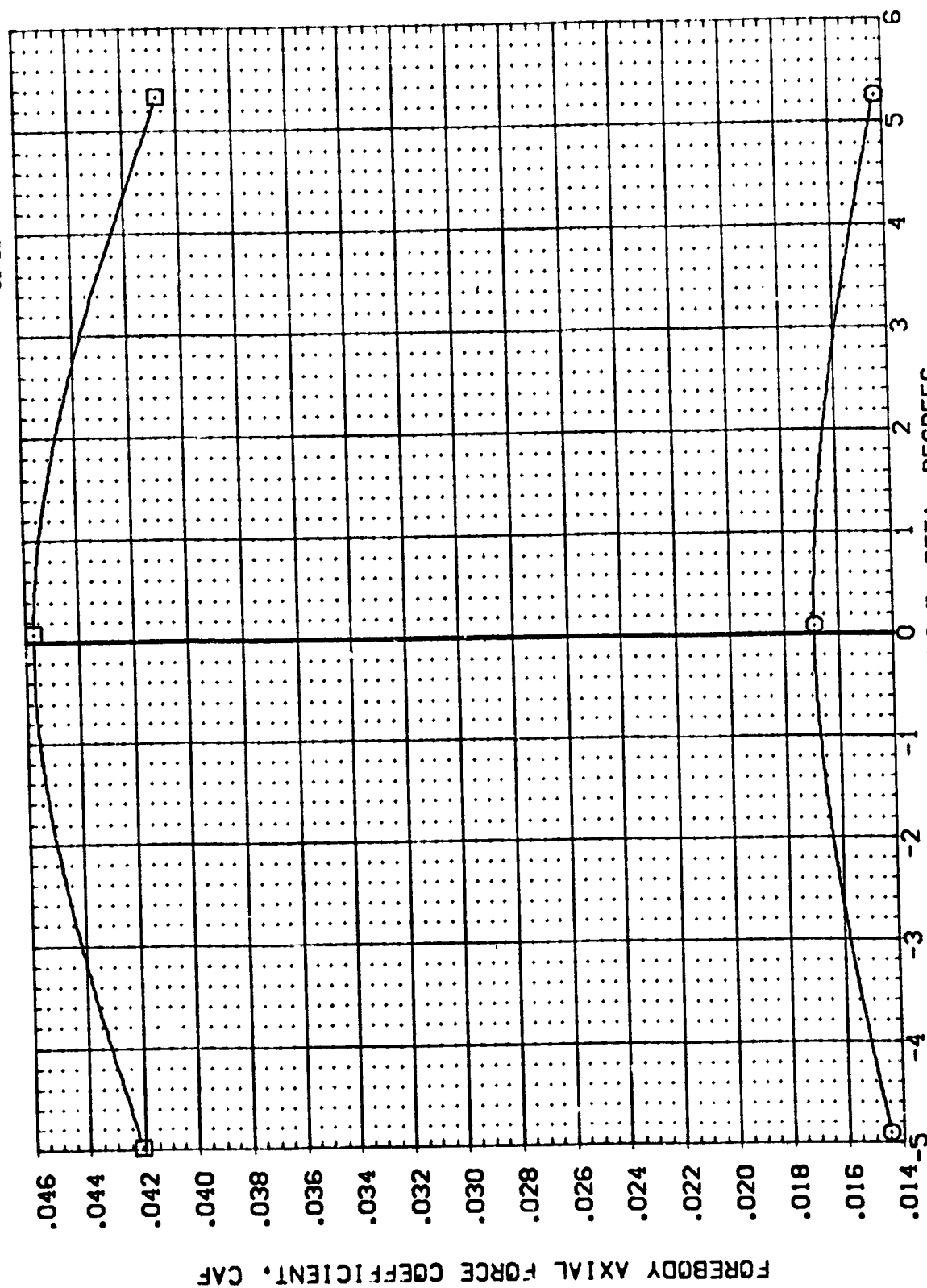
(RBPO44)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .597
□ .904

PARAMETRIC VALUES
-4.000 ELEVON -10.000
.000 RUOFLR .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8450 IN.
BREF 39.8450 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597,0.904

(RBP044)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
○ .597
□ .904

PARAMETRIC VALUES
-4.000 ELEVON -10.000
.000 R.O.F.L.R .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

SC.FT.
IN.
IN.
IN.
IN.
IN.
SCALE

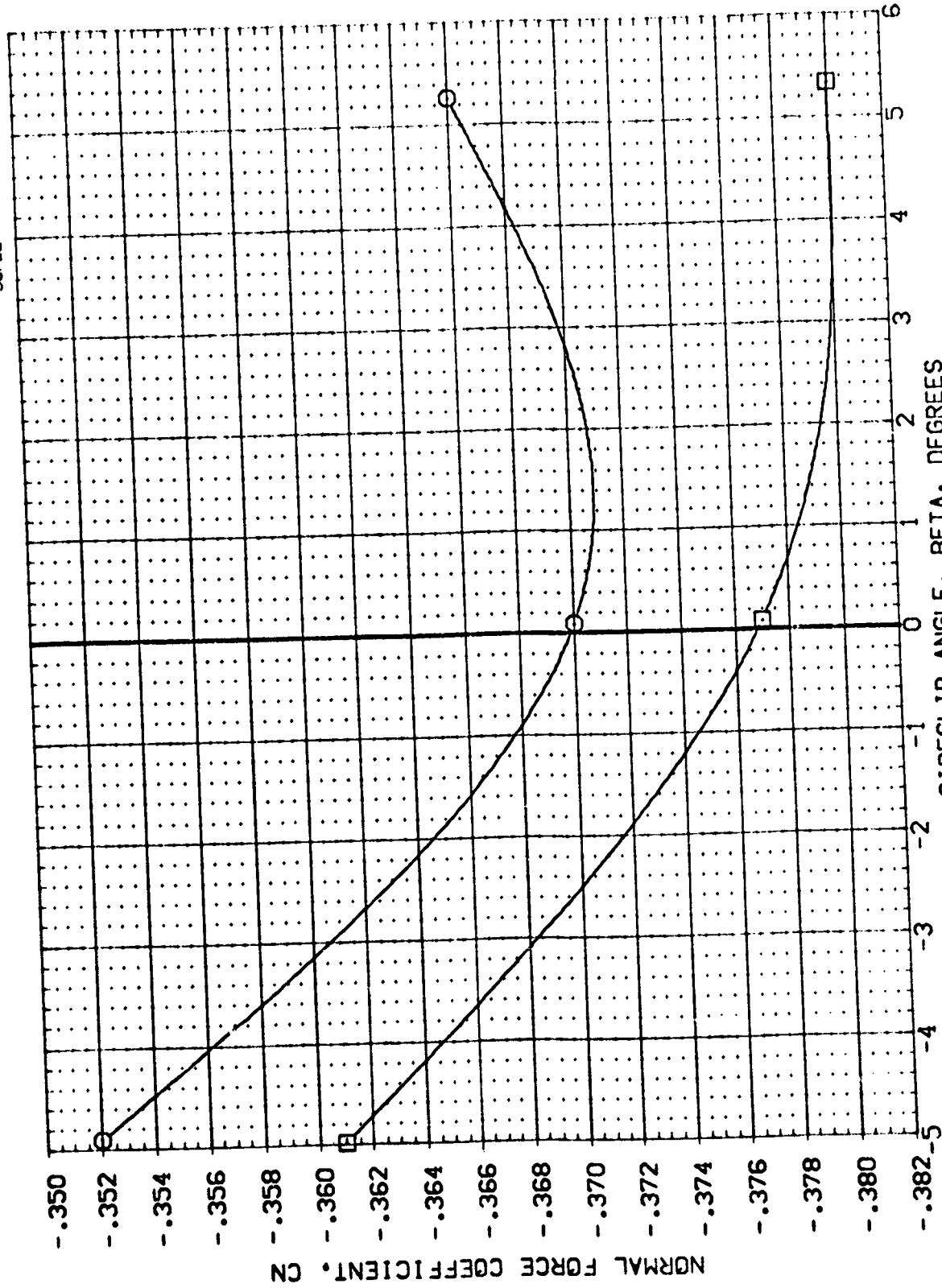


FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

(RBPO44)

AMES 11-707 0A12 C2A

SYMBOL MACH ALPHA RUDDER
O .597 -4.000 ELEVON -10.000
□ .904 .000 RJDFLR .000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 38.8490 IN.
BREF 39.8460 IN.
XMRP 32.3000 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0300

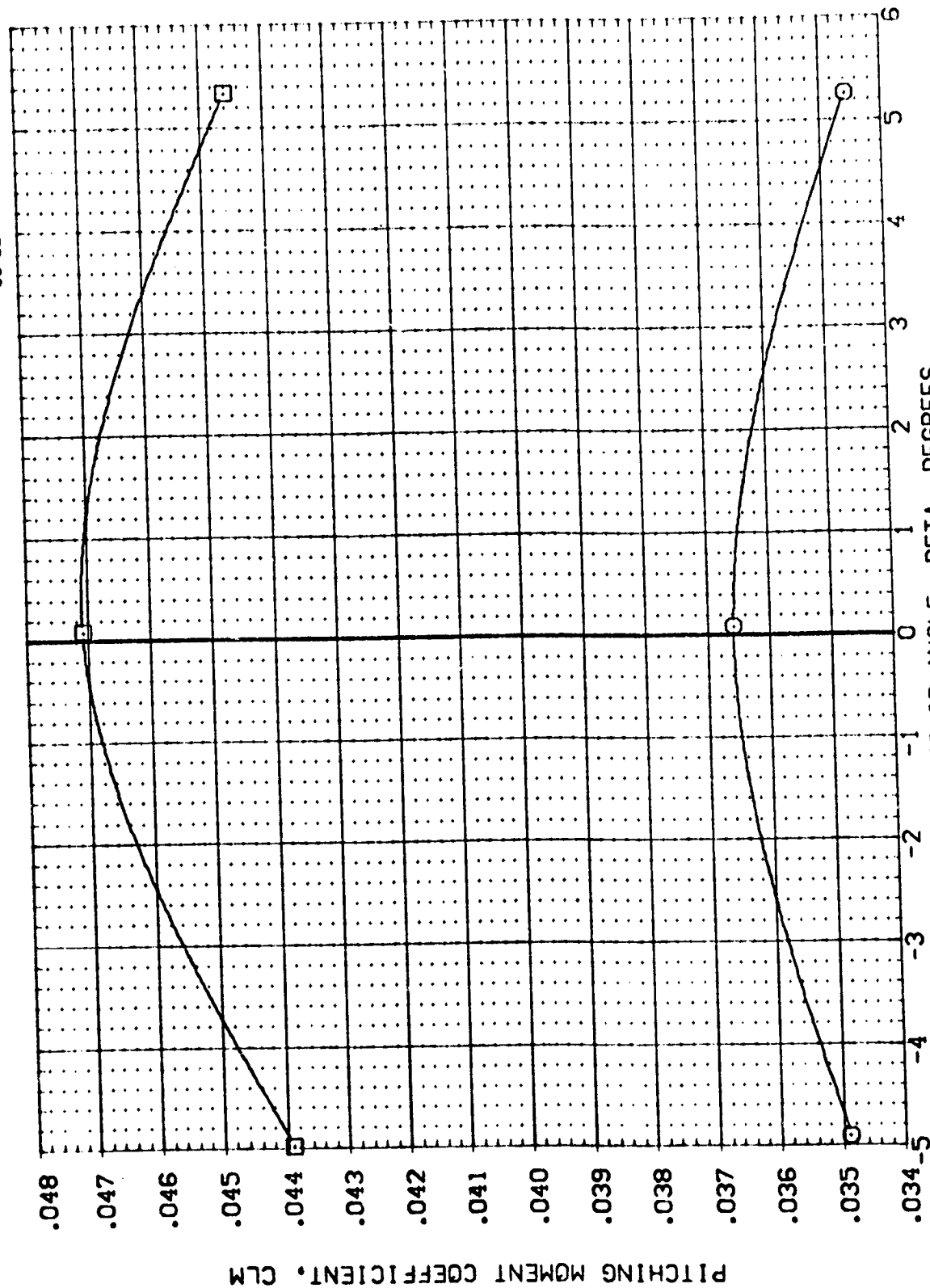


FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904
SIDESLIP ANGLE, BETA, DEGREES
PAGE 392

(RBP044)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER ELEVON RUOFLR
○ .597 .504 .000 .000 .000
□ .000 .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210 SQ.FT.
LREF 39.8490 IN.
BREF 39.8493 IN.
XMRP 32.3006 IN.
YMRP .0000 IN.
ZMRP .0000 IN.
SCALE .0360

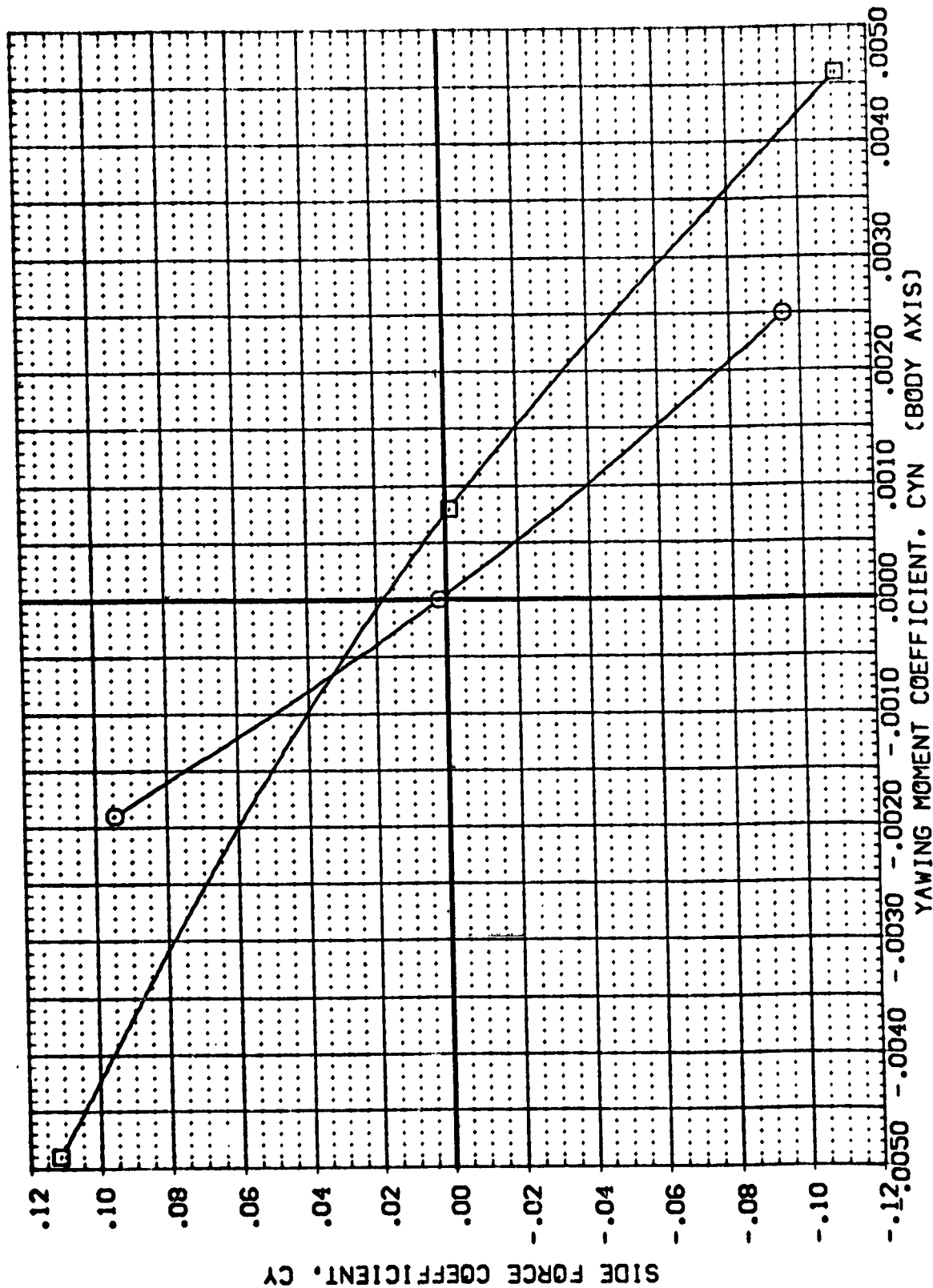


FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

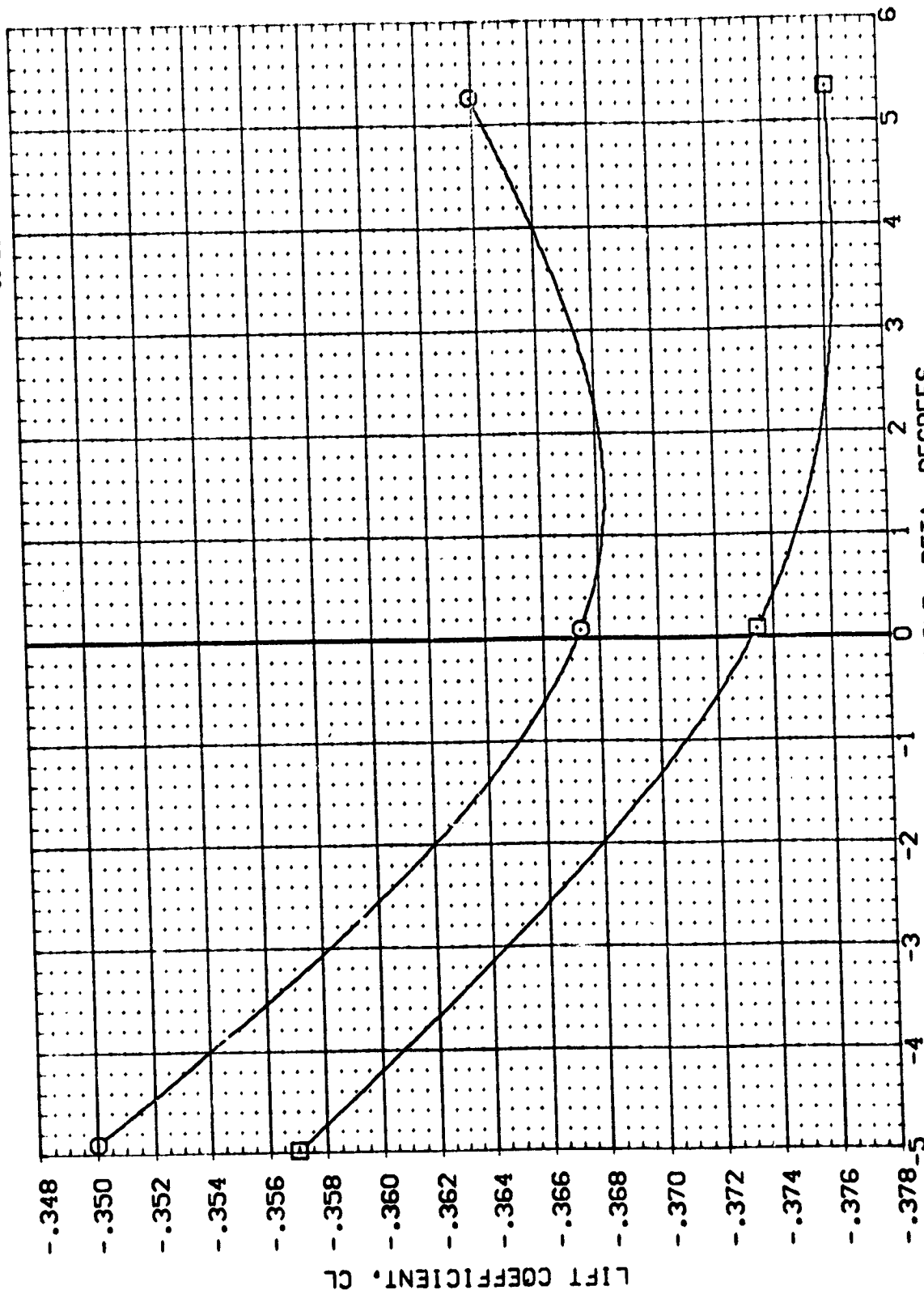
(ABP044)

AMES 11-707 GA12 02A

SYMBOL MACH ALPHA RUDDER
 .597
 .904

PARAMETRIC VALUES
 -4.000 ELEVON -10.000
 .000 RUOFLR .000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XMRP 32.5000
 YMRP .0000
 ZMRP .0000
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.47 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS., ELEVON=-10 DEGS., MN=0.597, 0.904

(RBP045)

AMES 11-707 0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|------|-------------------|------|
| □ | .598 | ALPHA | .000 |
| ○ | .901 | RUDER | .000 |
| | | ELEVON | .000 |
| | | RJDFLR | .000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRP | 32.3000 |
| YPRP | .0000 |
| ZPRP | .0000 |
| SCALE | .0300 |

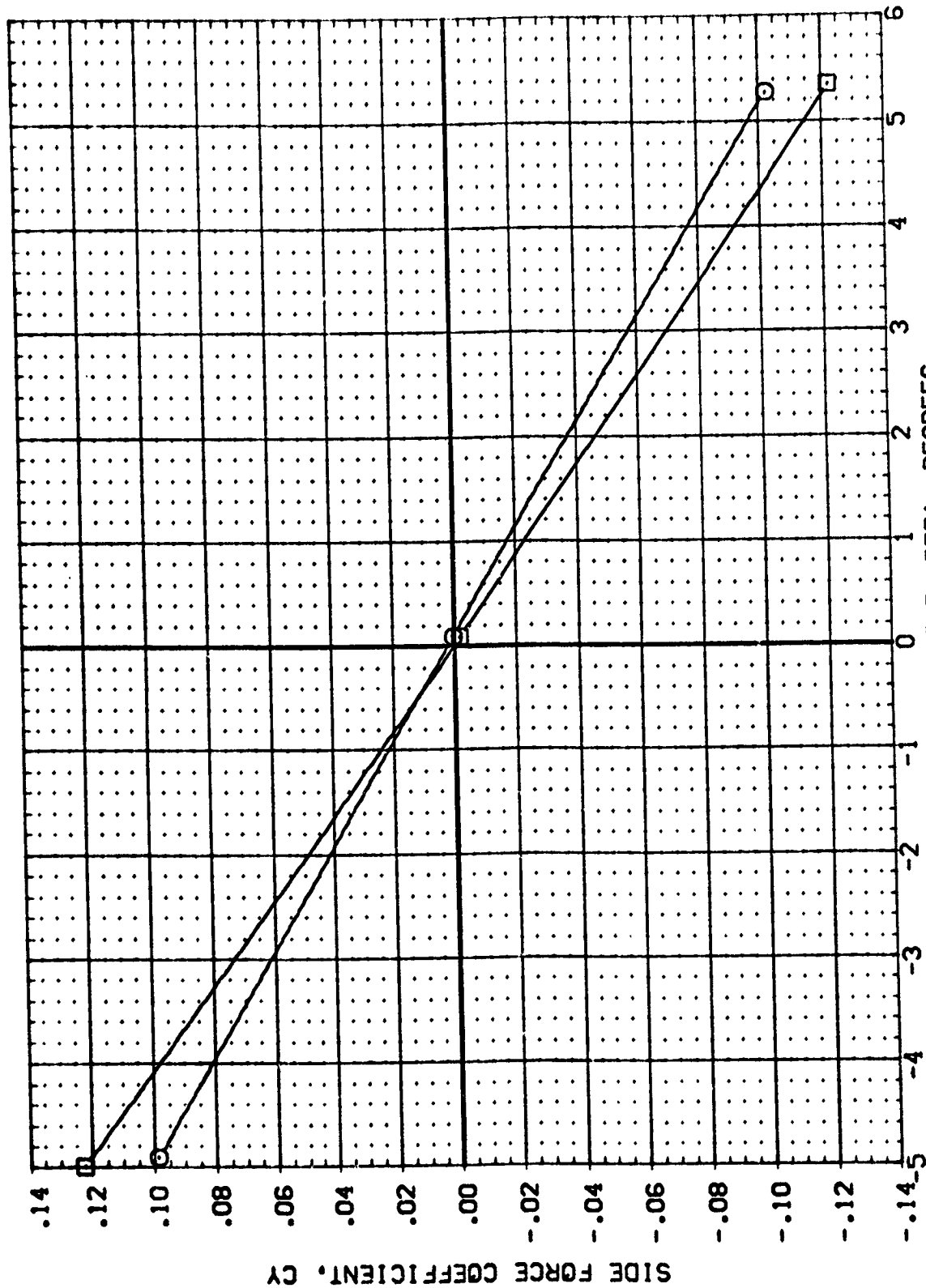


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
O .599 .901
□ -4.000 .000
ELEVON RUDDLR
.000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300
SQ.FT.
IN.
IN.
IN.
IN.
IN.

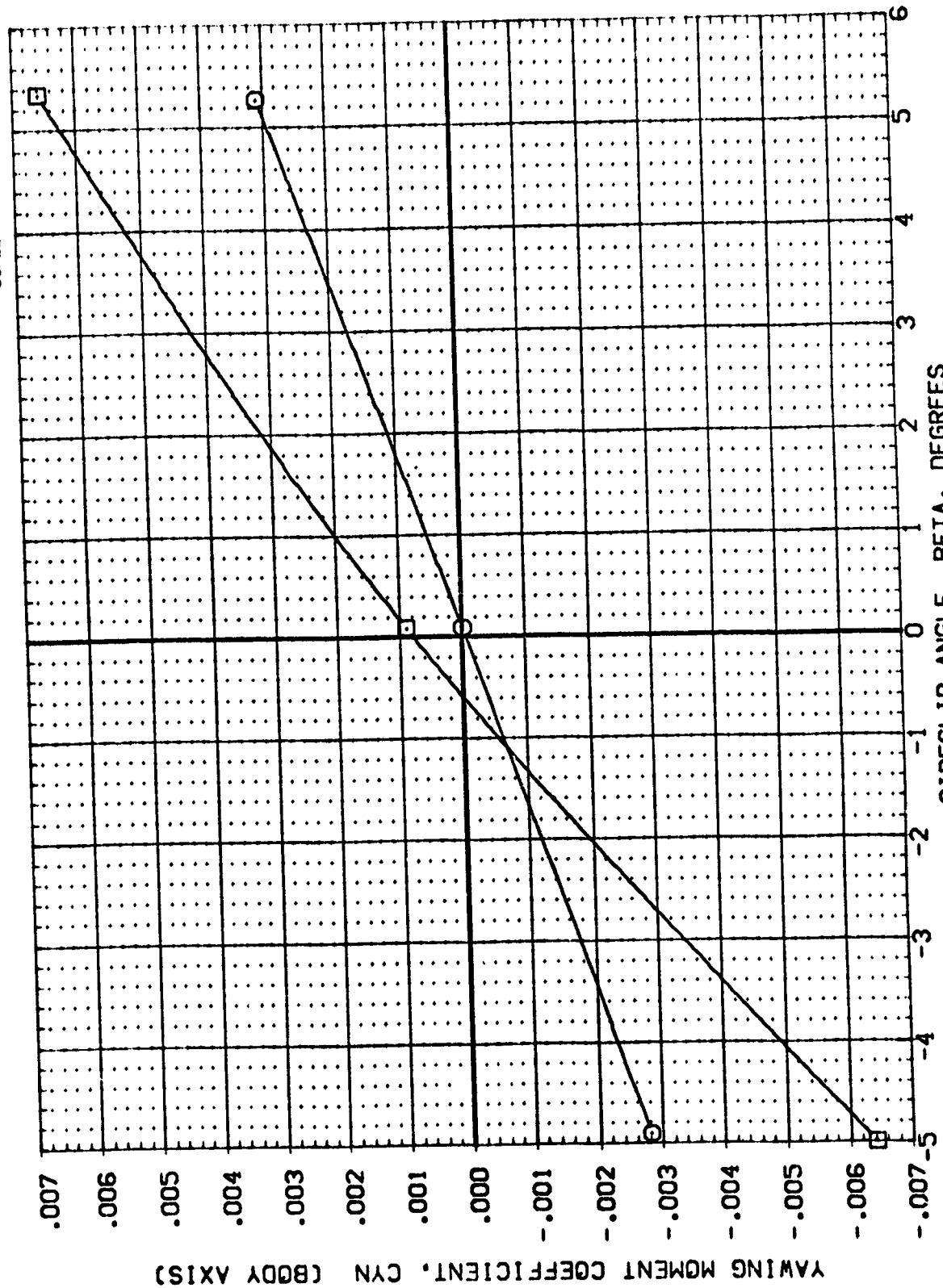


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

AMES 11-707 0A12 02A

SYMBOL MACH PARAMETRIC VALUES
□ .598 ALPHA -4.000 ELEVON .000
□ .901 RUDDER .000 RUDDLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300

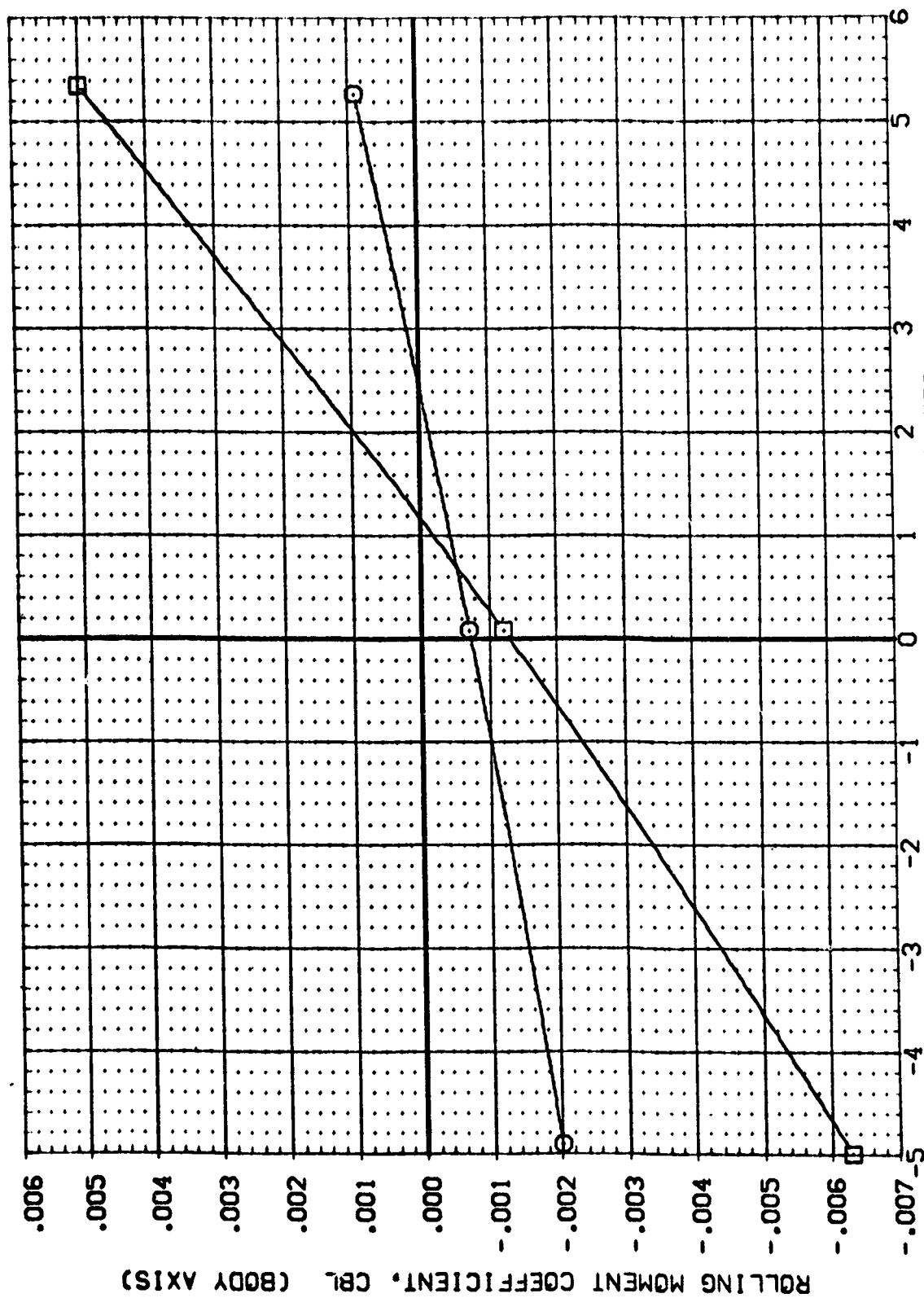


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

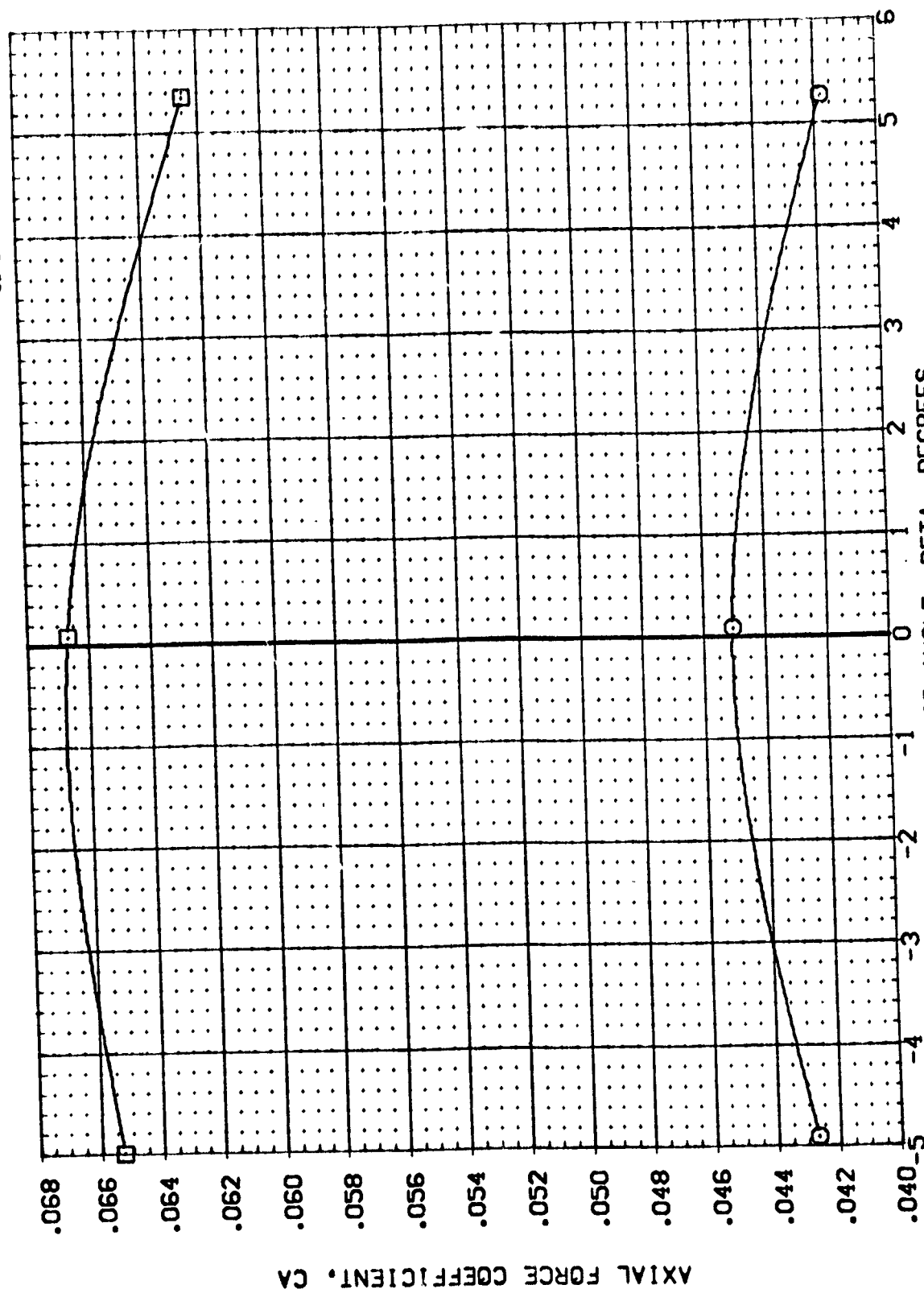
AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
□ .598
○ .901

PARAMETRIC VALUES
-4.000 ELEVON
.000 RUOFLR

.000
.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 38.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.48 ORBITER LAT-01R. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

AMES 11-707 0A12 02A

REFERENCE INFORMATION
 SC.FT.
 2.4210
 39.849C
 39.849C
 32.300C
 .0000
 .0000
 .0300
 SCALE

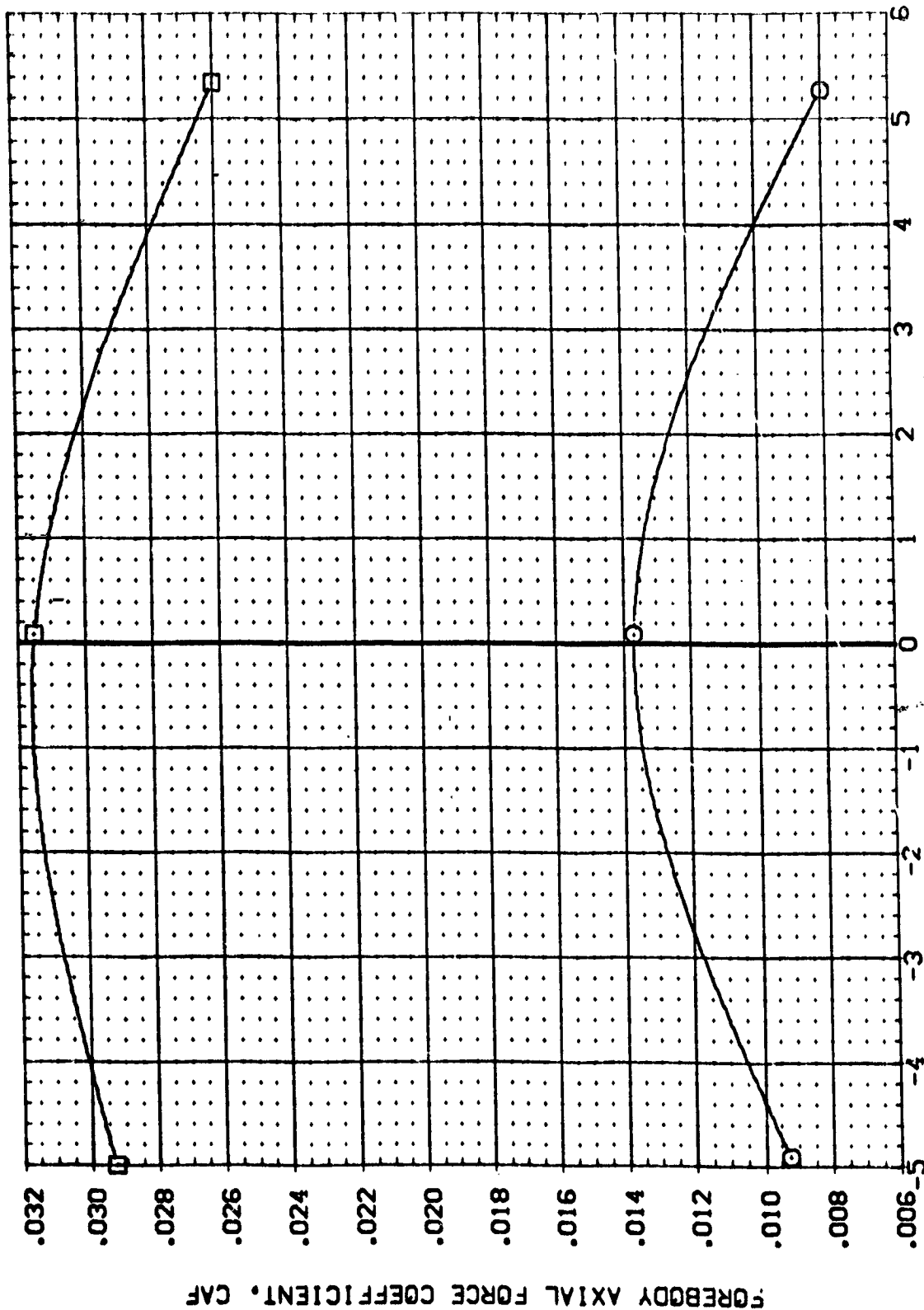
.000
 .000

PARAMETRIC VALUES
 -4.000 ELEVON
 .000 RUDELR

ALPHA
 RUDDER

MACH
 .598
 .901

SYMBOL
 □
 ○



SIDESLIP ANGLE, BETA, DEGREES

FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

AVES 11-707 0A12 02A

| | | | |
|------|------|-------------------|------|
| SYMB | MACH | PARAMETRIC VALUES | |
| ○ | .598 | ALPHA | .000 |
| □ | .901 | RUDER | .000 |
| | | ELEVON | .000 |
| | | RUFLR | .000 |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.421 | SCALE |
| LREF | 38.8450 | |
| BREF | 39.916 | |
| XREF | 32.300 | |
| YREF | 32.300 | |
| ZREF | 32.300 | |
| SCALE | 1.000 | |

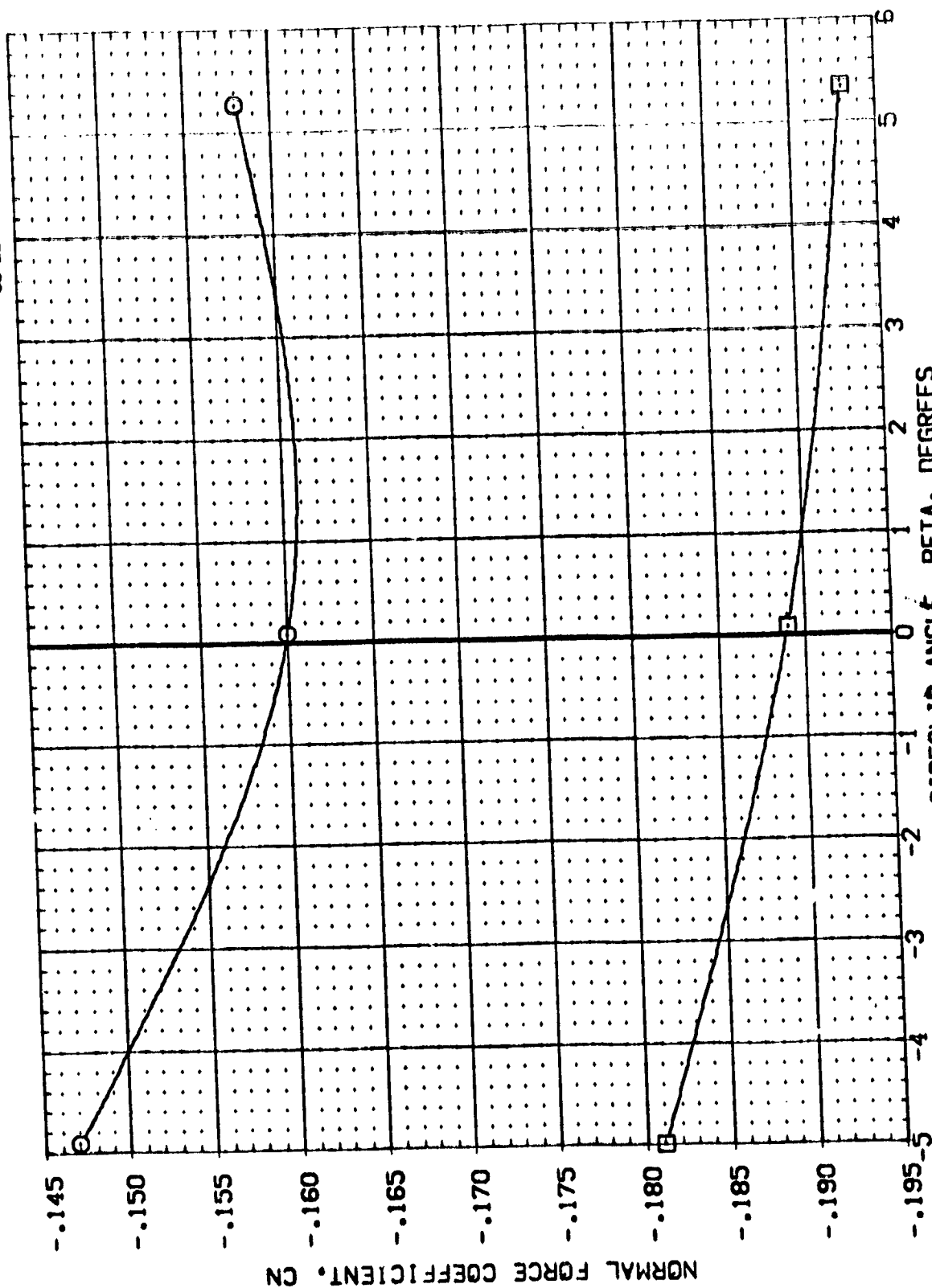


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(RBP045)

AMES 11-707 0A12 02A

| | | | | | |
|--------|------|-------|-------------------|--------|------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | .000 |
| ○ □ | .598 | .901 | -4.000 | RUDFLR | .000 |

REFERENCE INFORMATION
 SREF 2.4212
 LREF 38.6450
 BREF 38.6450
 XREF 32.3000
 YREF 32.3000
 ZREF 32.3000
 SCALE 1.000

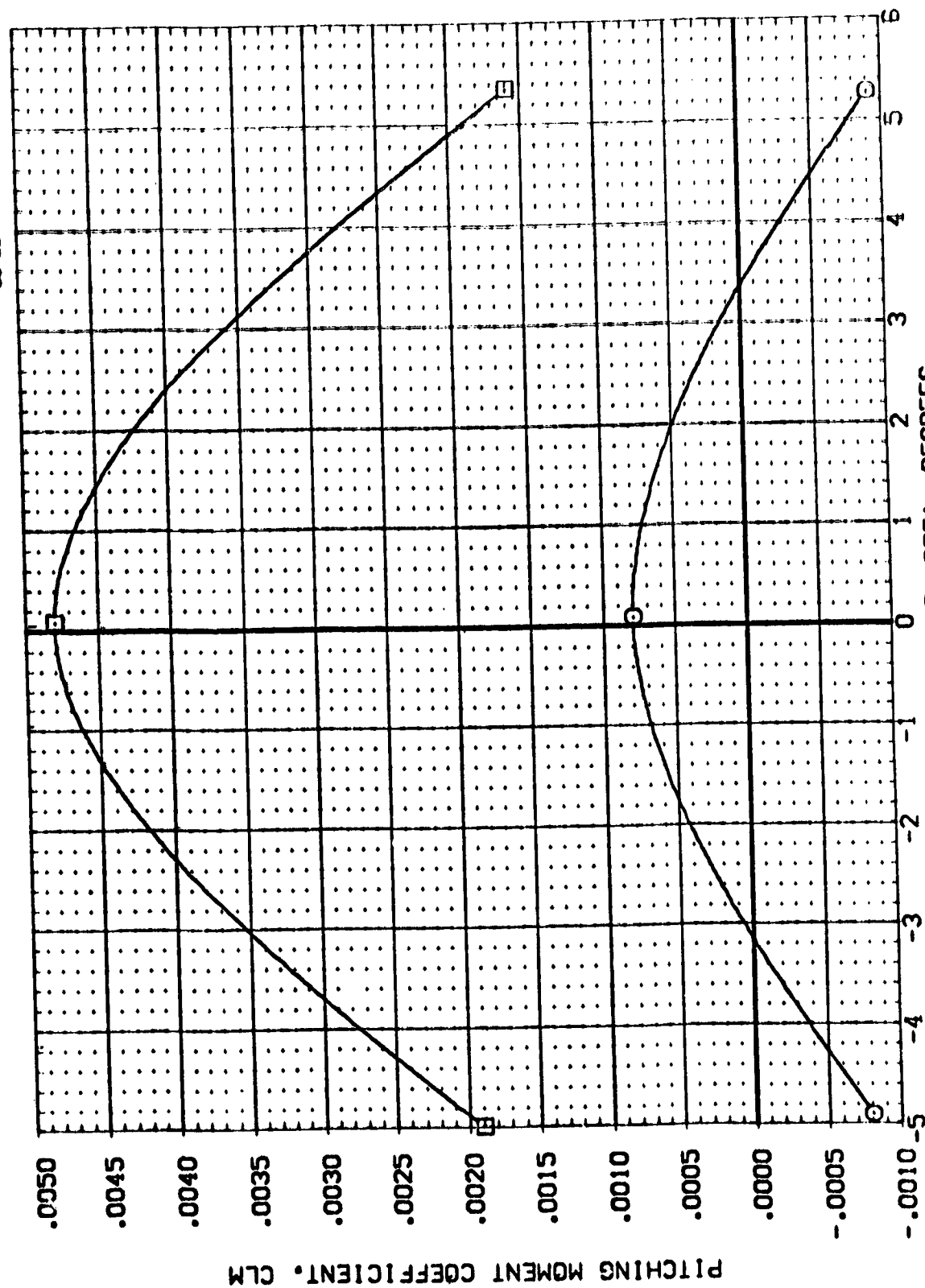


FIG.48 ORBITER LAT-OIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(R3PC45)

AMES 11-707 CA12 C2A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
□ .598 .000 .000 .000 .000

REFERENCE INFORMATION
SPEC 7-4210
REF 28-8100
BPE 28-8100
XVPS 28-8100
VPS 28-8100
SCALE

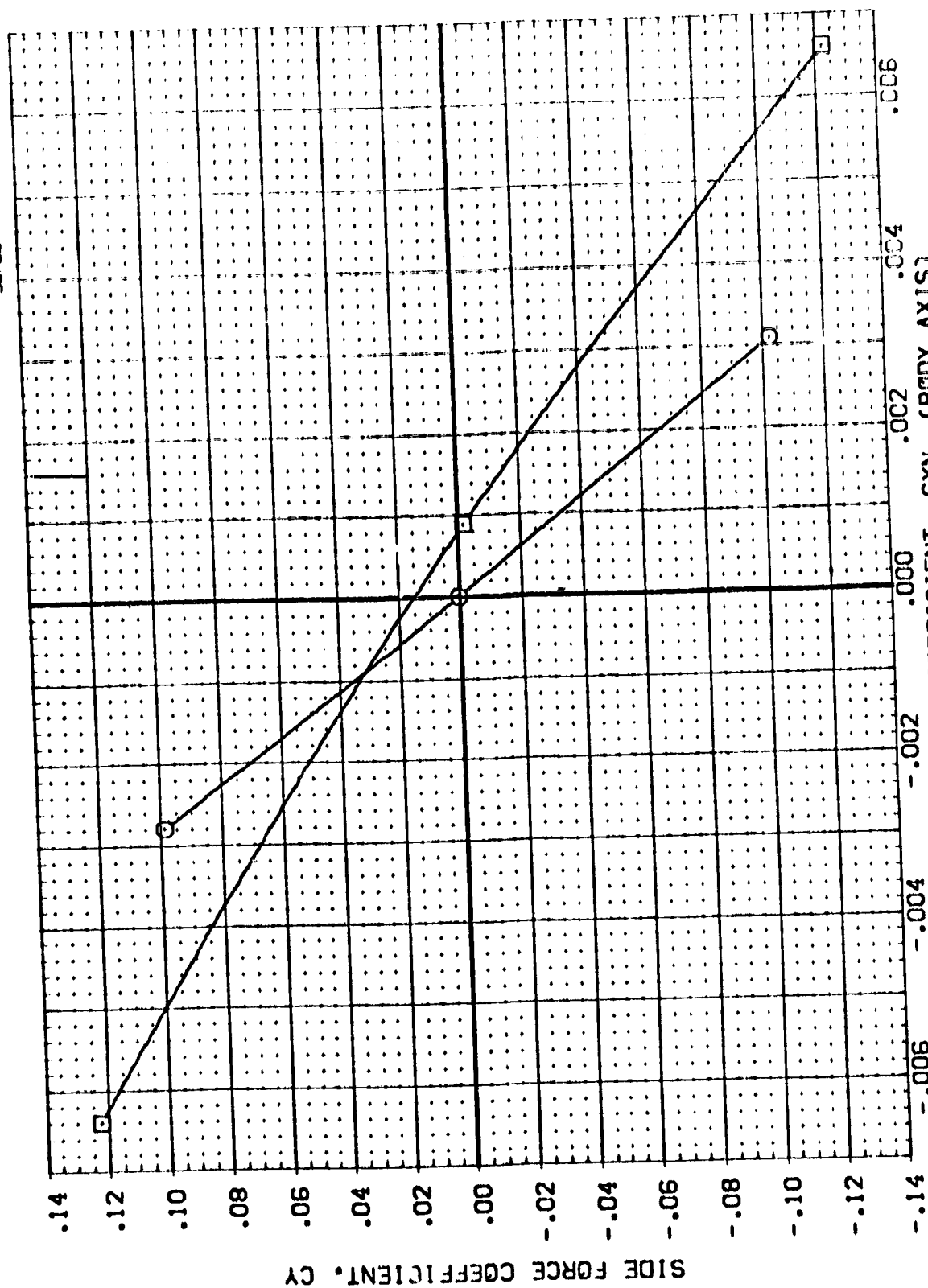


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(ABP045)

AMES 11-707 0A12 02A

SYMBOL MACH ALPHA RUDDER
 00 .598 .901
 PARAMETRIC VALUES
 -4.000 ELEVON .000
 .000 RJOFLR .000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 38.8490 IN.
 BREF 39.8480 IN.
 XMRP 32.5000 IN.
 YMRP .0000 IN.
 ZMRP .0000 IN.
 SCALE .0000

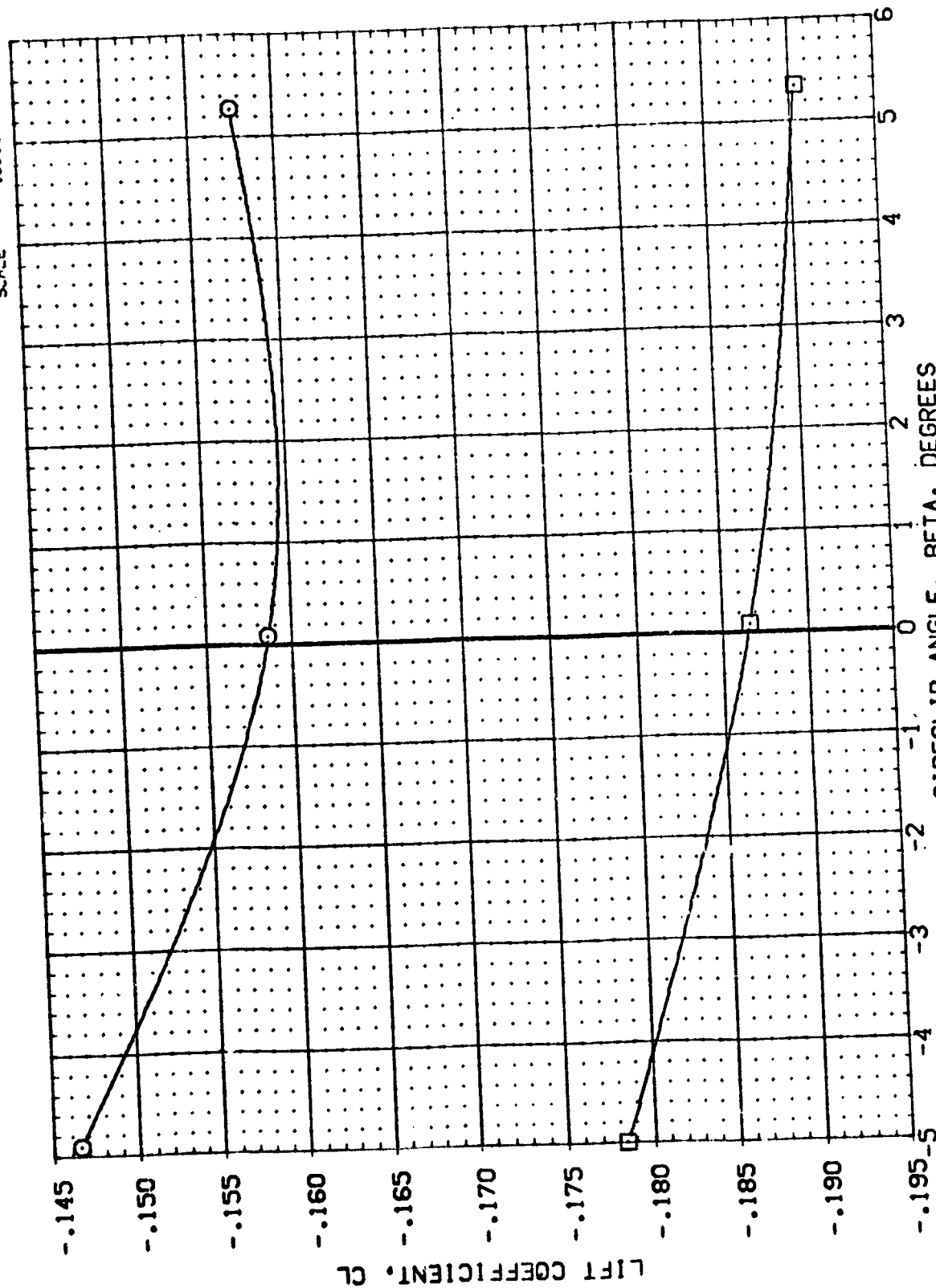


FIG.48 ORBITER LAT-DIR. DATA AT ALPHA=-4 DEGS. MN=0.598,0.901

(R90001)

AVES 87-707-CA:2 02A

| SYMBOL | MACH | BETA | RUDER | PARAMETRIC VALUES | ELEVON | R.O.F.L.R | SCALE |
|--------|-------|------|-------|-------------------|--------|-----------|-------|
| | 2.498 | .000 | .000 | .000 | .000 | 40.000 | |
| | 3.502 | .000 | .000 | .000 | .000 | 40.000 | |

| REFERENCE INFORMATION | SCALE |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 33.8450 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0000 |

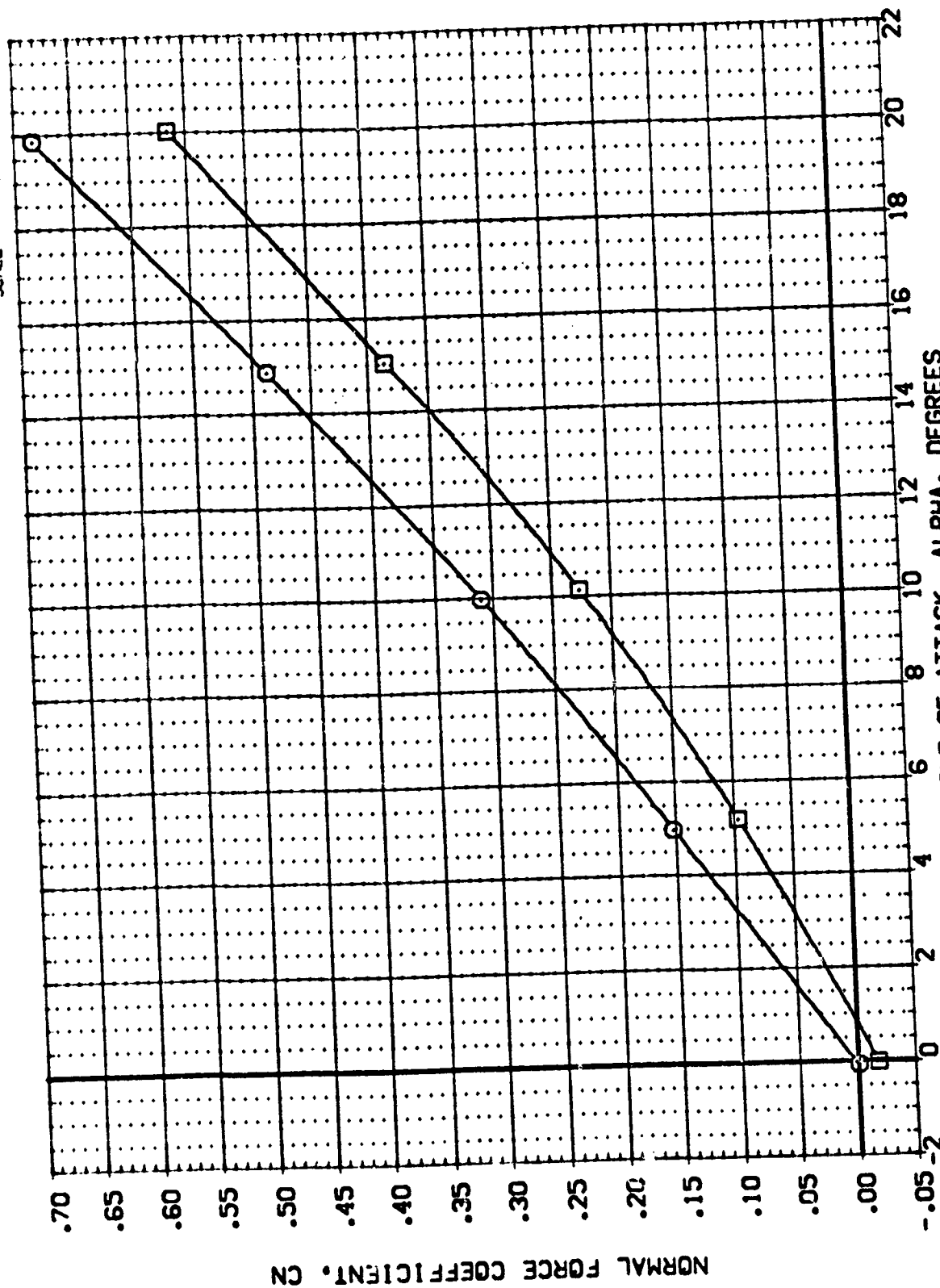


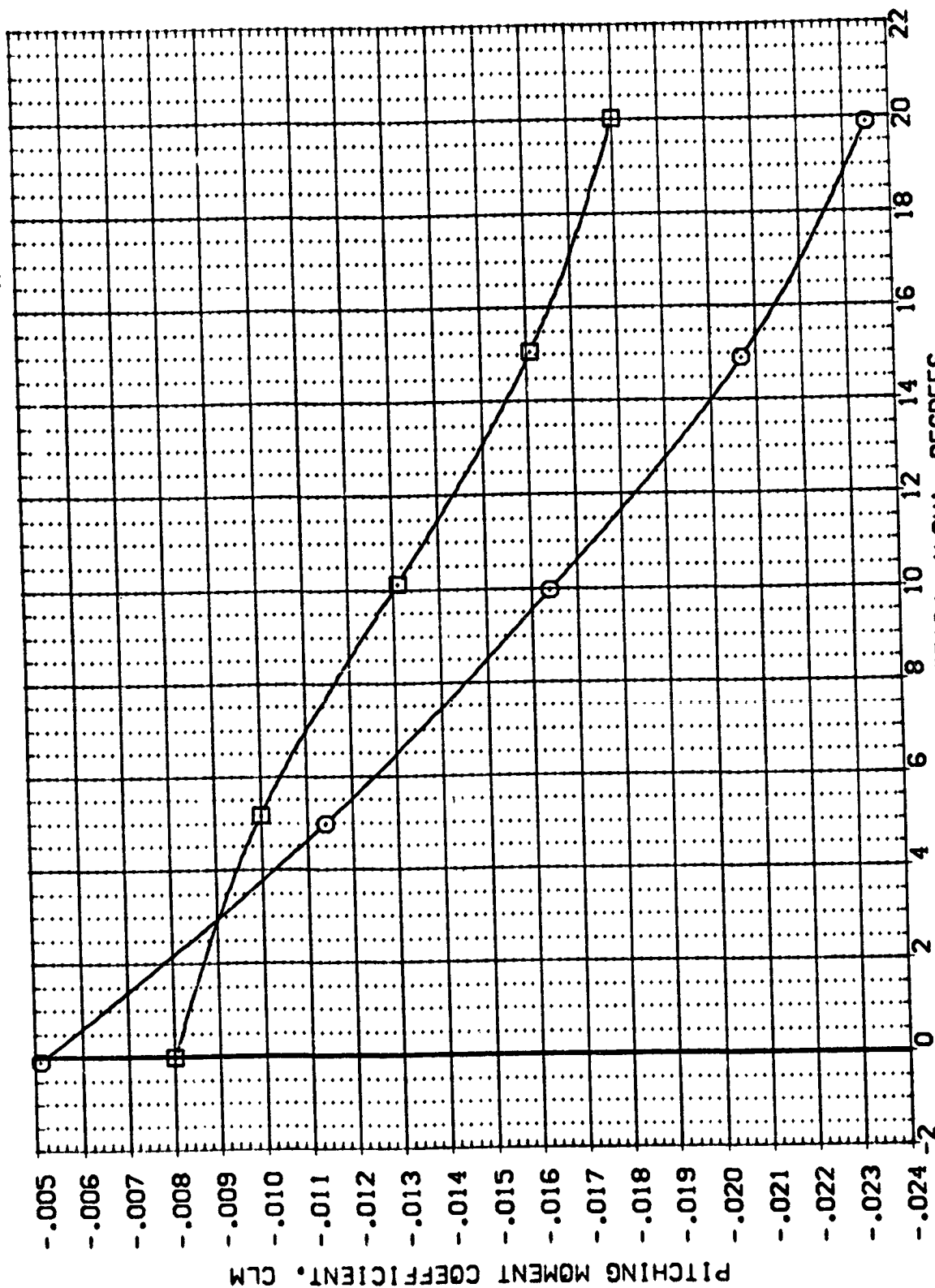
FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

(RB00001)

AMES 87-707-QA12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| | | BETA | ELEVON |
| ○ | 2.498 | .000 | .000 |
| □ | 3.502 | .000 | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRP | 32.3000 |
| YPRP | .0000 |
| ZPRP | .0000 |
| SCALE | .0300 |



ANGLE OF ATTACK, ALPHA, DEGREES

FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

AMES 87-707-CA12 C2A

(RB0001)

| | | | | |
|--------|-------|------|-------------------|---------|
| SYMBOL | MACH | BETA | PARAMETRIC VALUES | SC.F.T. |
| ○ | 2.498 | .000 | ELEVON | 2.4210 |
| □ | 3.502 | .000 | RJFLR | 39.8450 |
| | | .000 | 40.000 | 39.8450 |
| | | .000 | 32.3000 | 32.3000 |
| | | .000 | YMRP | .0000 |
| | | .000 | ZMRP | .0000 |
| | | .000 | SCALE | .0300 |

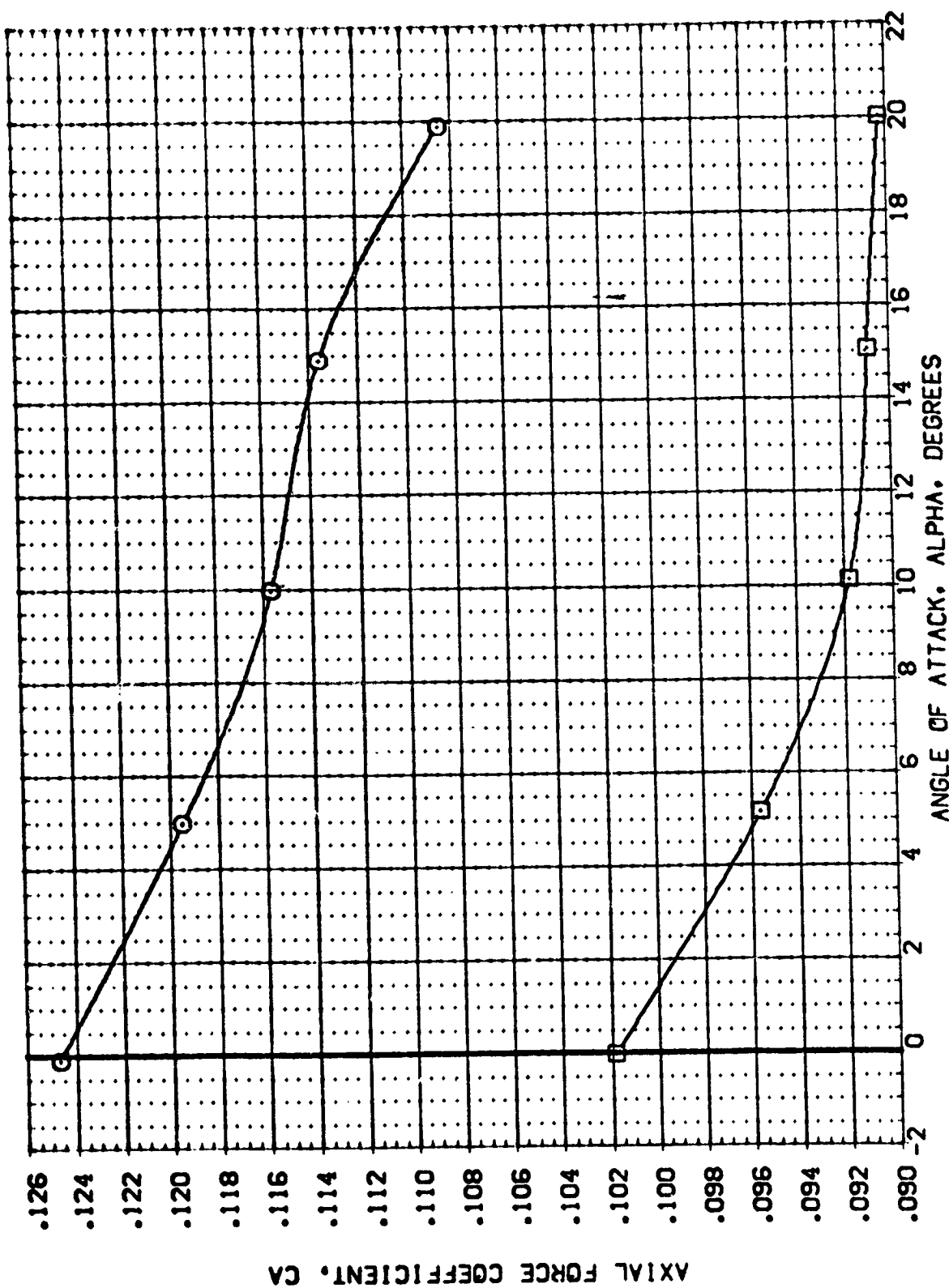


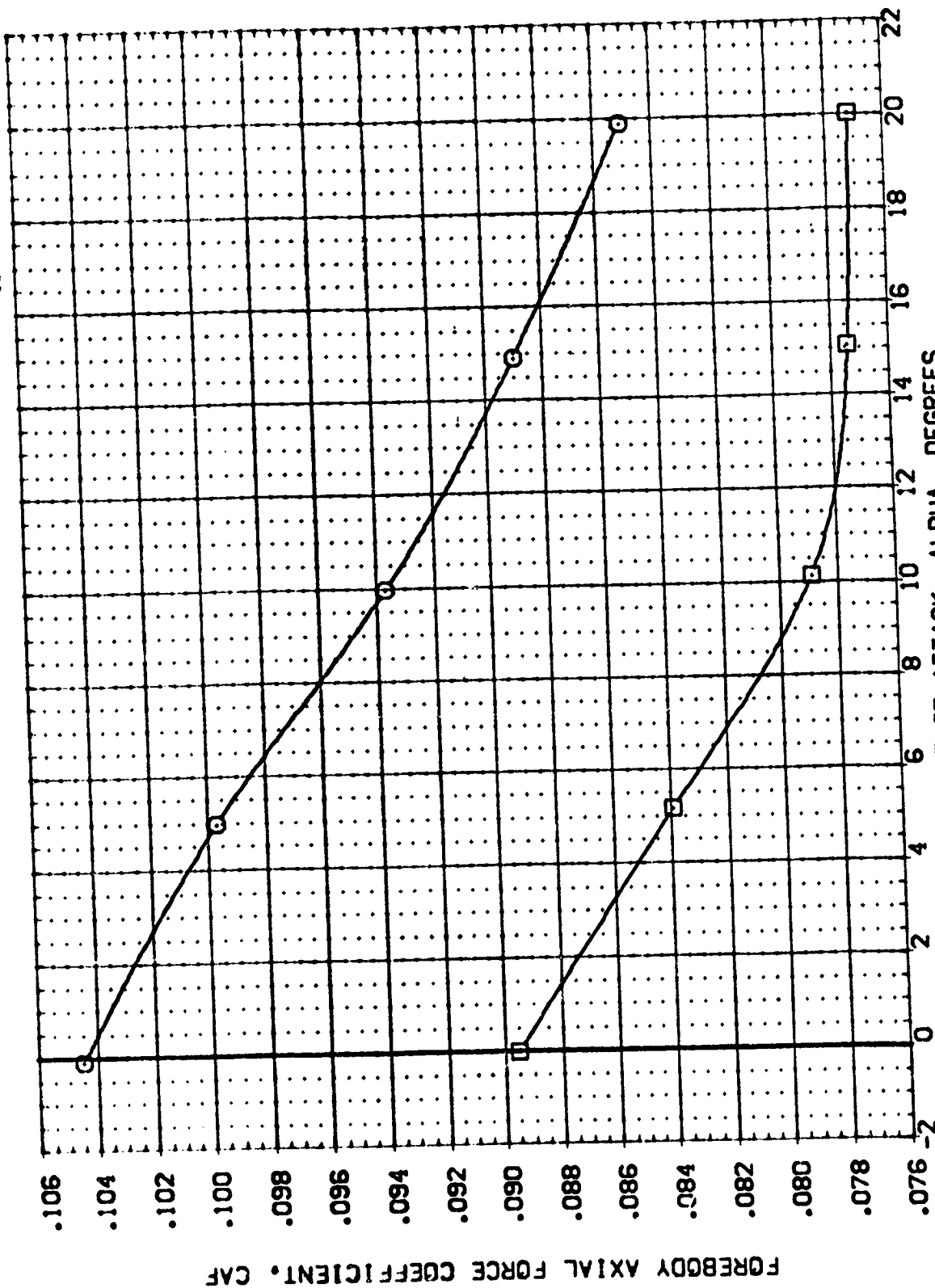
FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

(RB0001)

AVES 87-707-CA:2 32A

SYNCH. VAC-
2.498
3.502
BETA
R.DDER
PARAMETRIC VALUES
.000
.000
ELEVON
R.D.F.L.R
.000
40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
YREF 32.3000
ZREF .0000
SCALE .0000
SCALE .0000



ANGLE OF ATTACK, ALPHA, DEGREES

FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

(RB0001)

AMES 87-707-CA:2 02A

SYMBOL
○ □

MACH
2.498
3.502

BETA
R-DOER

PARAMETRIC VALUES
.000
.000
.000
ELEVON
R-DOFLR

.000
40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
EREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

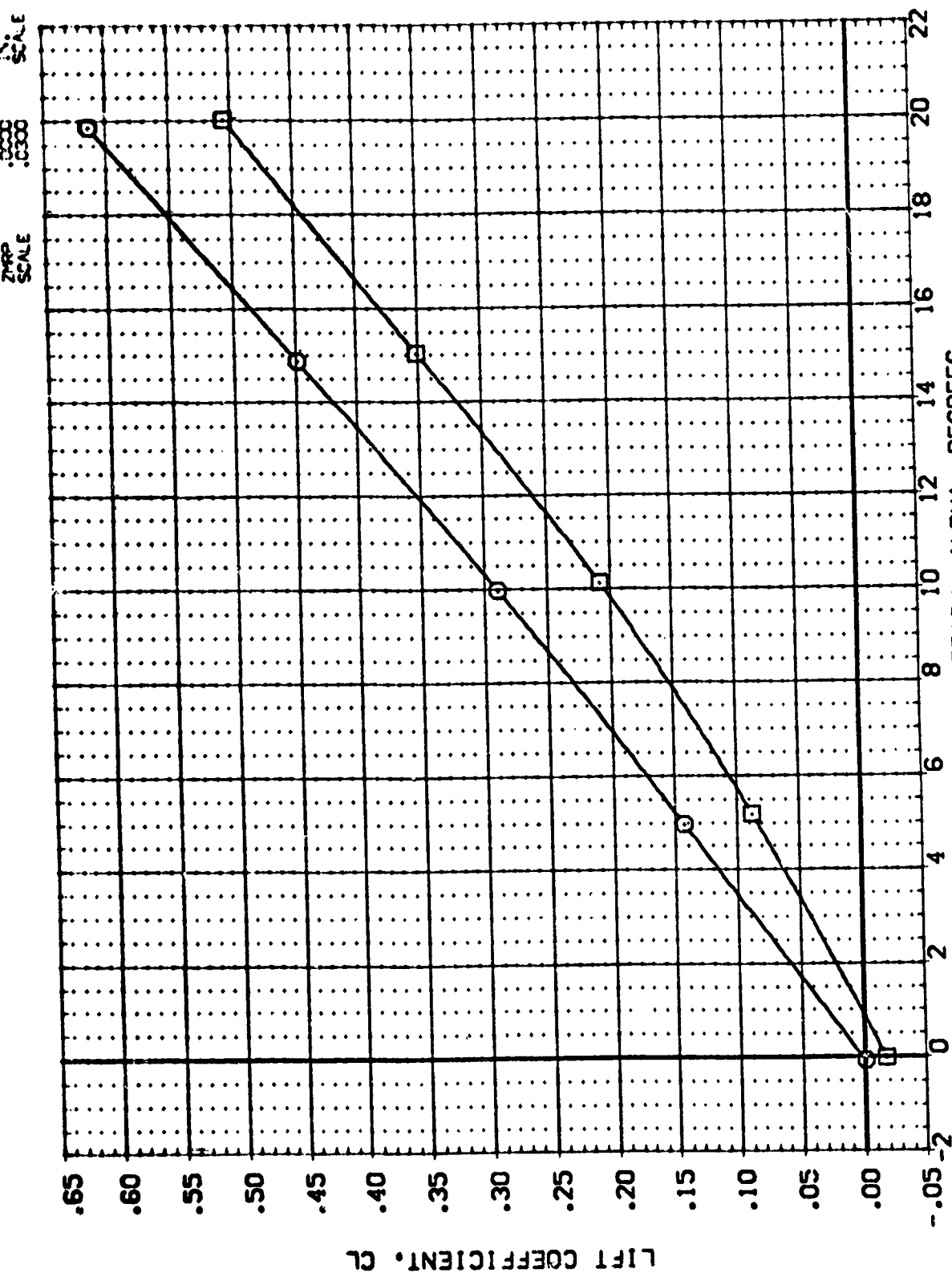


FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

(R50001)

AMES 87-707-3A12 02A

| | | | |
|--------|-------|-------------------|--------|
| SYMBOL | MACH | PARAMETRIC VALUES | |
| | | BETA | ELEVON |
| □ | 2.498 | .000 | .000 |
| ○ | 3.502 | .000 | 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SC.FT. |
| LREF | 29.8490 | |
| BREF | 29.8490 | |
| XMRP | 32.3000 | |
| YMRP | .0000 | |
| ZMRP | .0000 | |
| SCALE | .0300 | |

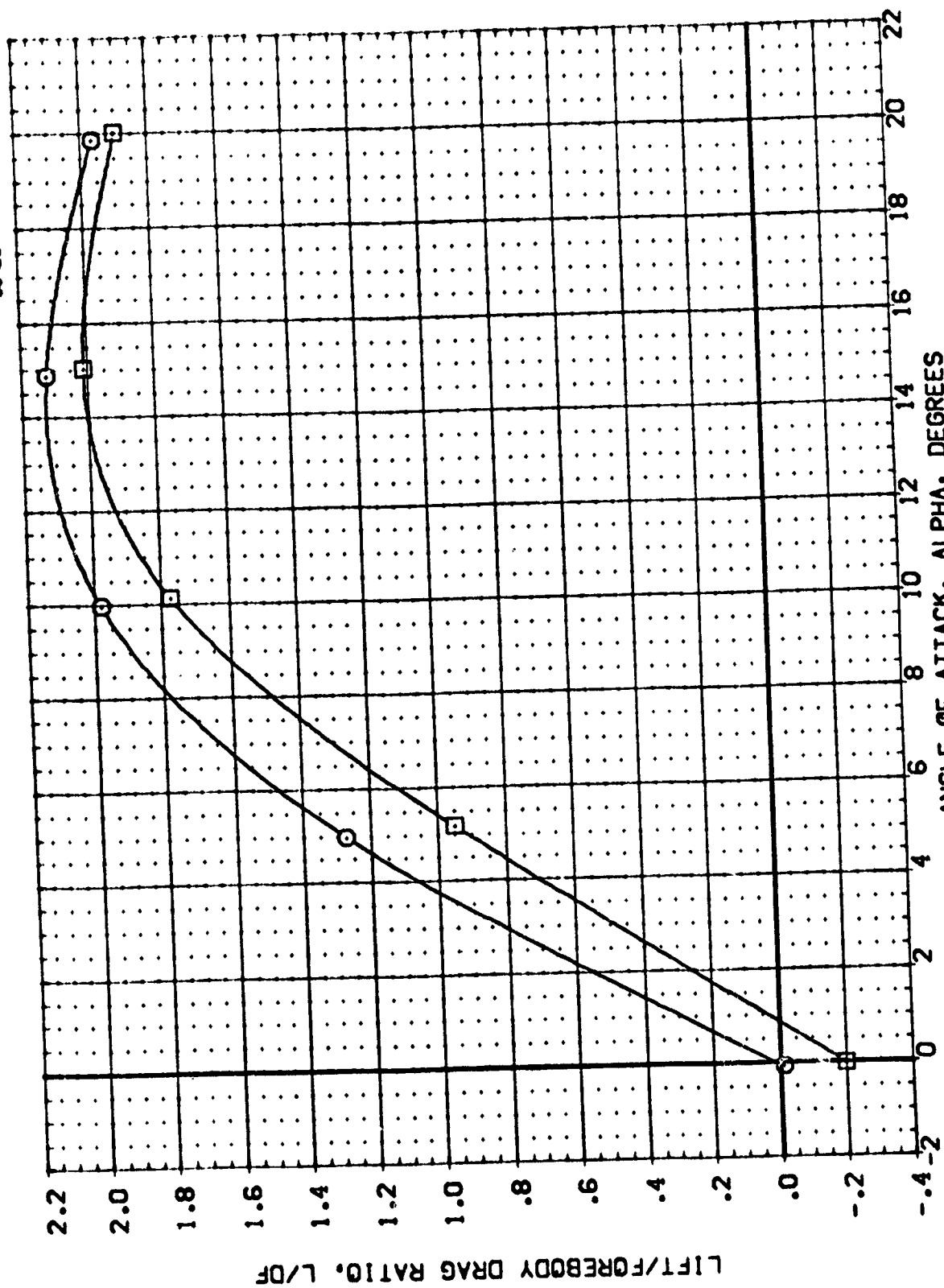


FIG.49 ORBITER LONGITUDINAL AERODYNAMIC DATA, MN=2.5,3.5

(RB000C2)

AMES 87-707-0A12 02A

SYMBOL WACH ALPHA R.00ER
 2.498 3.502
 .000 .000
 ELEVON R.00FLR
 .000 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 38.8490
 XGRP 32.3000
 YGRP .0000
 ZGRP .0000
 SCALE .0300

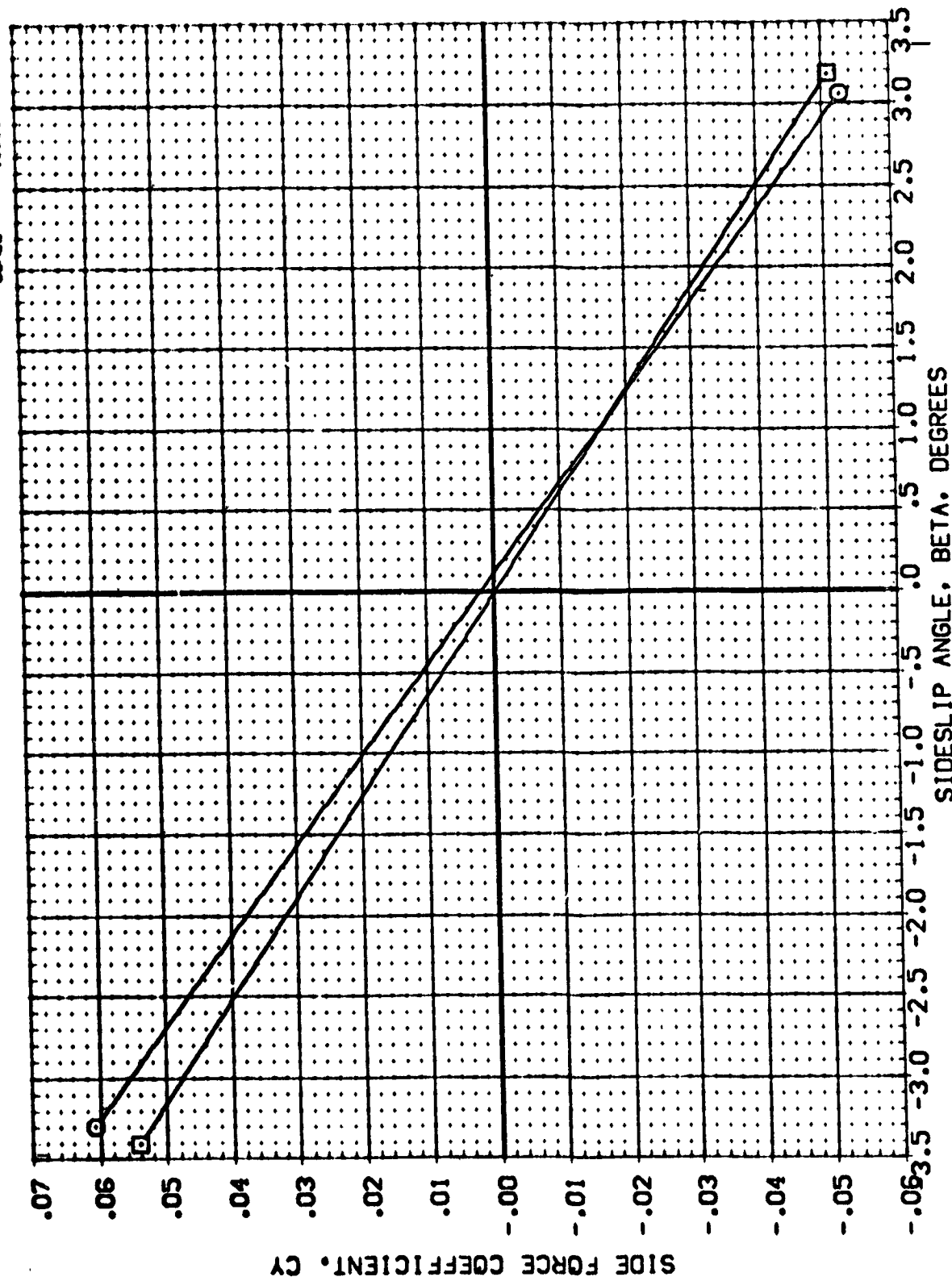


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

(R80002)

AVES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | | ELEVON | RUDDER | SCALE |
|--------|-------|-------------------|--------|--------|--------|-------|
| | | ALPHA | RUDDER | | | |
| 110 | 2.498 | .000 | .000 | .000 | 40.000 | |
| | 3.502 | | | | | |

REFERENCE INFORMATION
 SREF 2.4213
 LREF 38.8490
 BREF 38.8490
 YMRP 32.3000
 YMRP 10.0000
 ZMRP 10.0000
 SCALE 10.0000

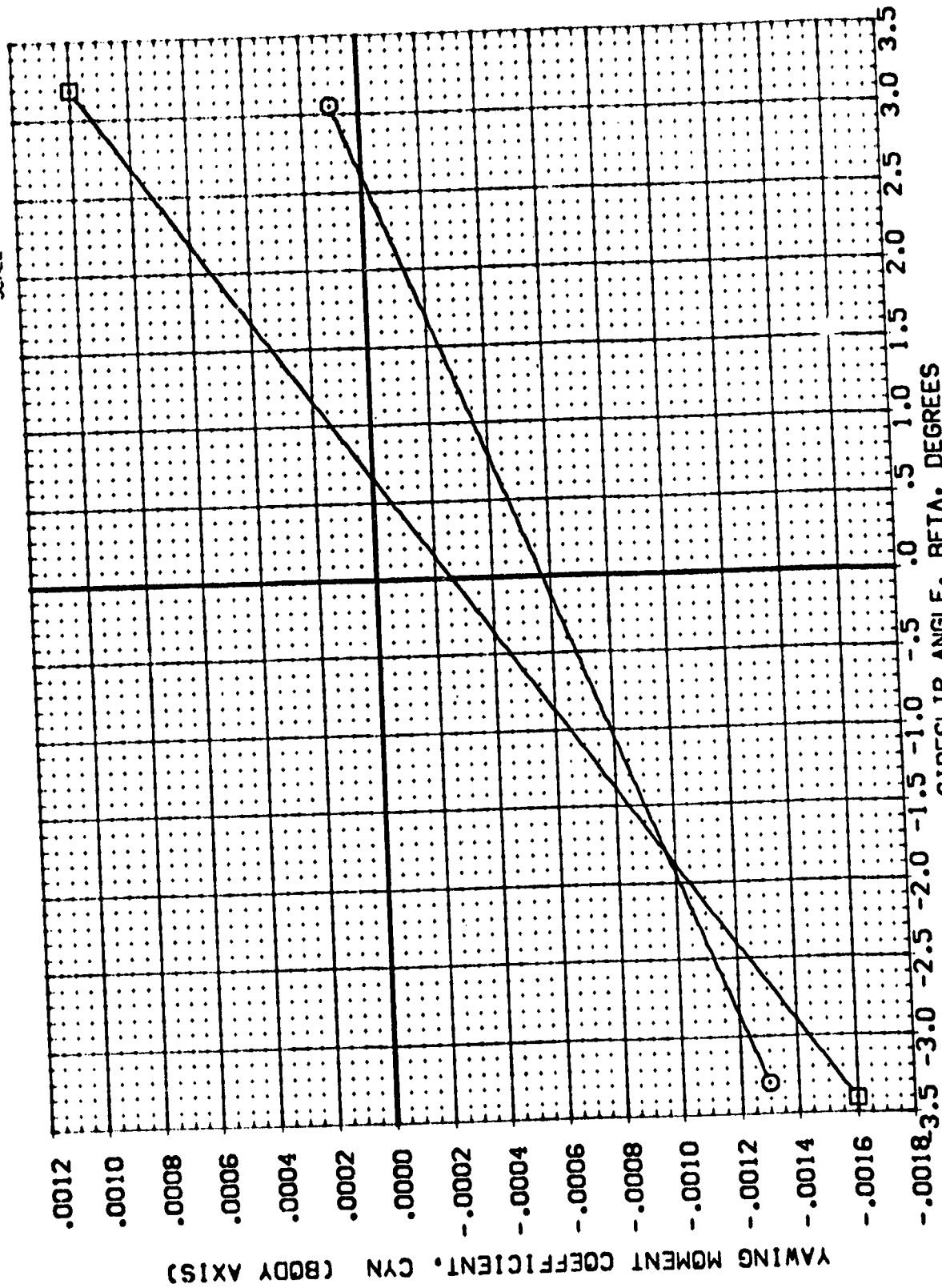


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

(R9G002)

AVES 87-7C7-CA12 02A

SYSC. WACH. ALPHA. ELEVON. RUDDER. RUDFLR. 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XPRP 32.3000
YPRP 0.0000
ZPRP 0.0000
SCALE 0.0000

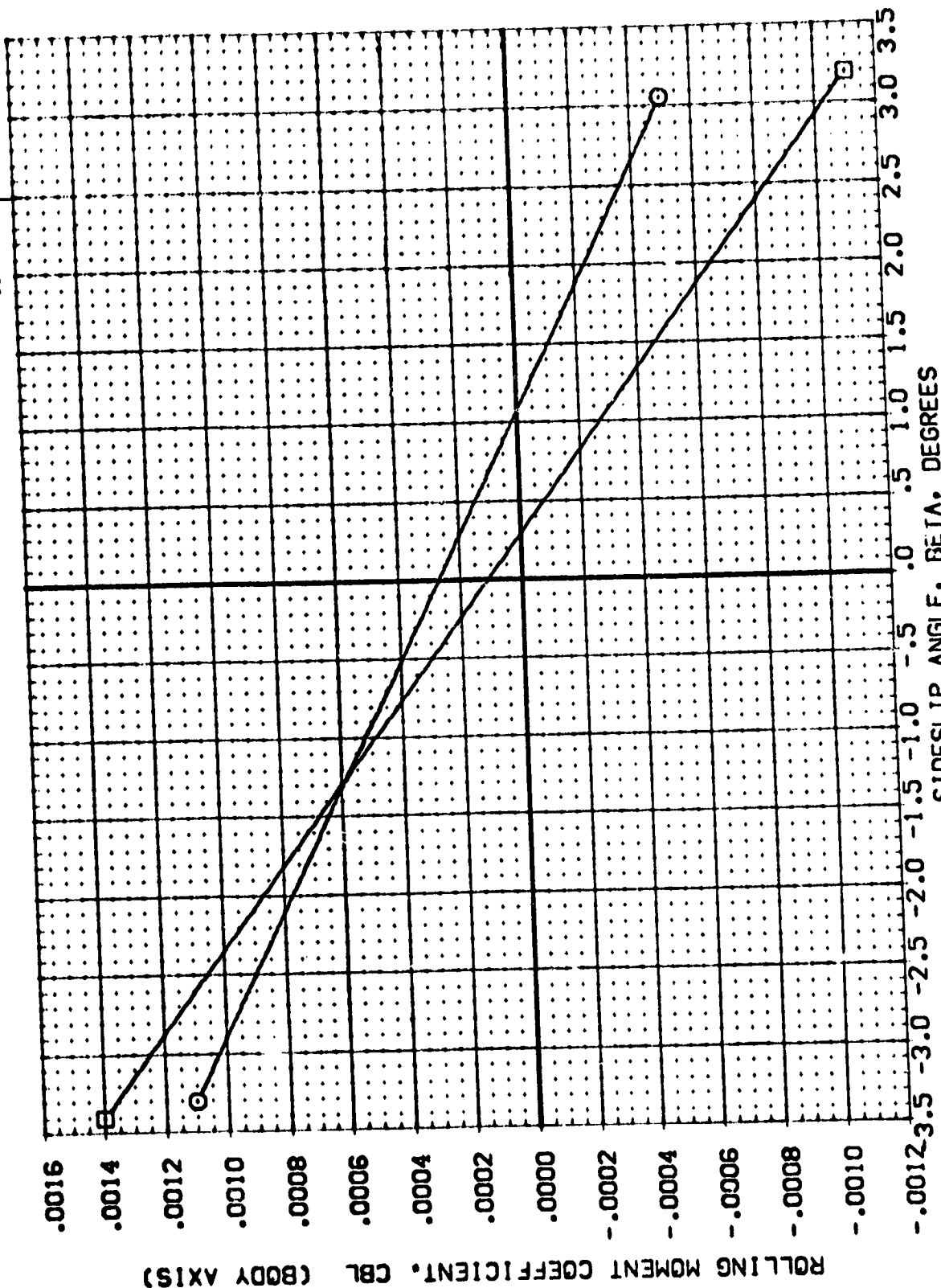


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

(RBG002)

AVES 87-707-CA:2 C2A

SYMBOL WACH ALPHA RUDER PARAMETRIC VALUES
2.498 3.502 .000 .000 .000 .000
ELEVON RUDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8180
BREF 38.8180
XREF 31.3000
YREF 31.3000
ZREF 31.3000
SCALE 300

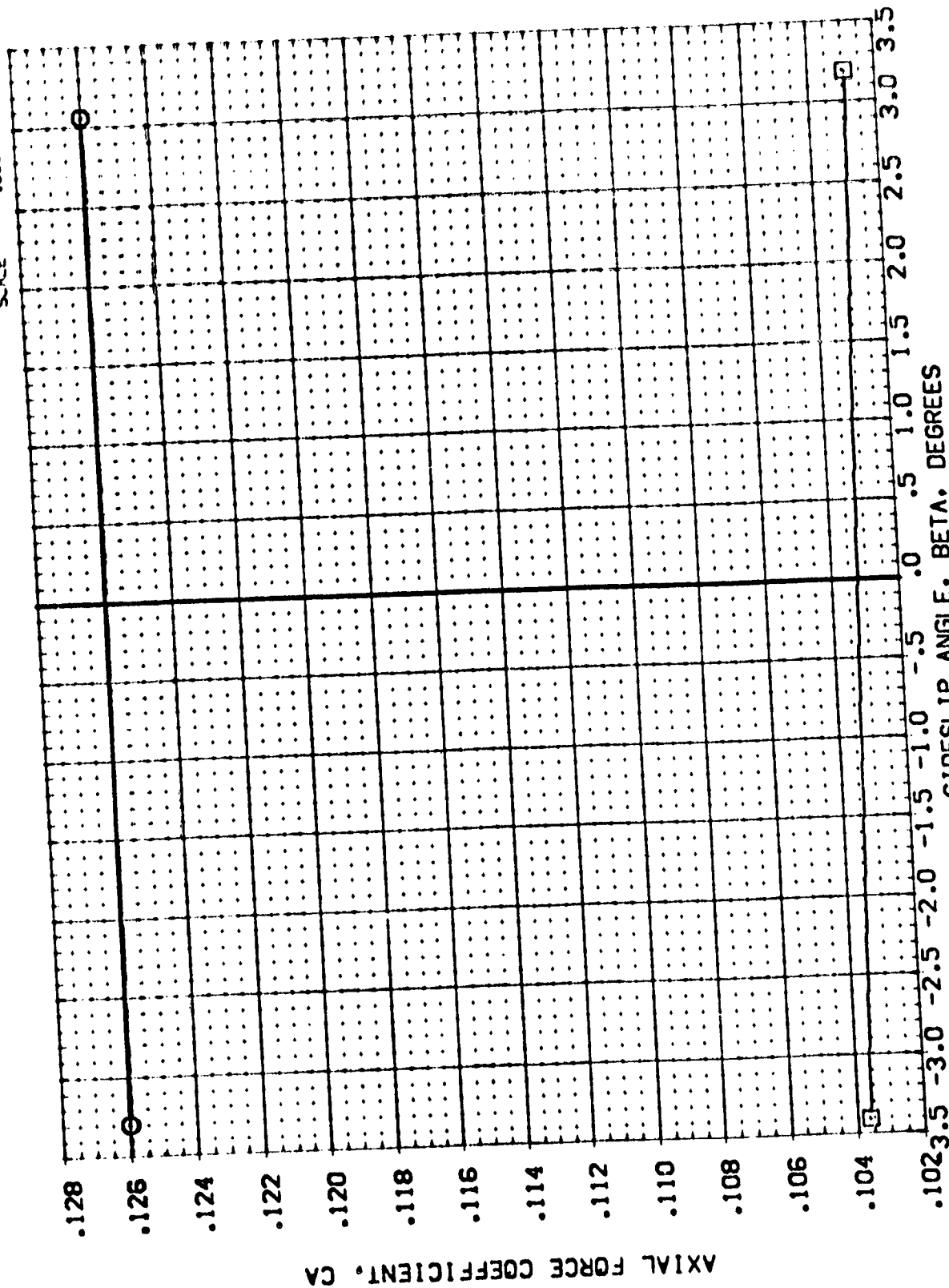


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=0 DEGS., MN=2.5,3.5

(R80002)

AVES 87-707-CA12 C2A

| | | | |
|--------|-------|-------------------|--------|
| SYMBOL | MAC | PARAMETRIC VALUES | |
| ○ | 2.498 | ALPHA | .000 |
| □ | 3.502 | ELEVON | 40.000 |
| | | ROFLR | |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.4210 | SCALE |
| LREF | 38.8450 | |
| BREF | 38.8450 | |
| YREF | 32.3000 | |
| ZREF | 1.0000 | |
| SCALE | 1.0000 | |

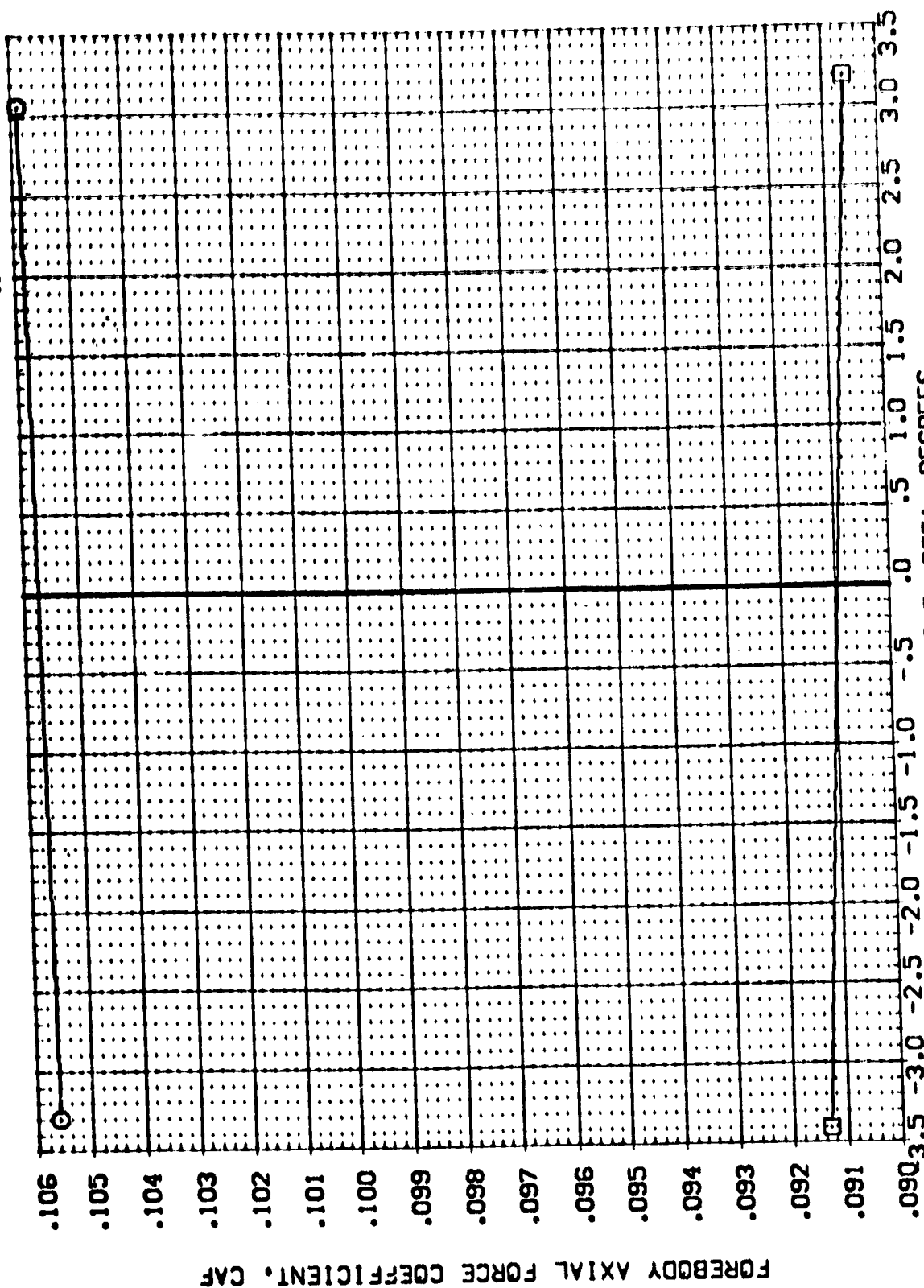


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

AMES 87-707-GA:2

108-5 () ()

2.49
3.50

ALPINE
RIDGE

ALPINE
RIDGE?

PARAMETRIC VALUES

40.000

40.000

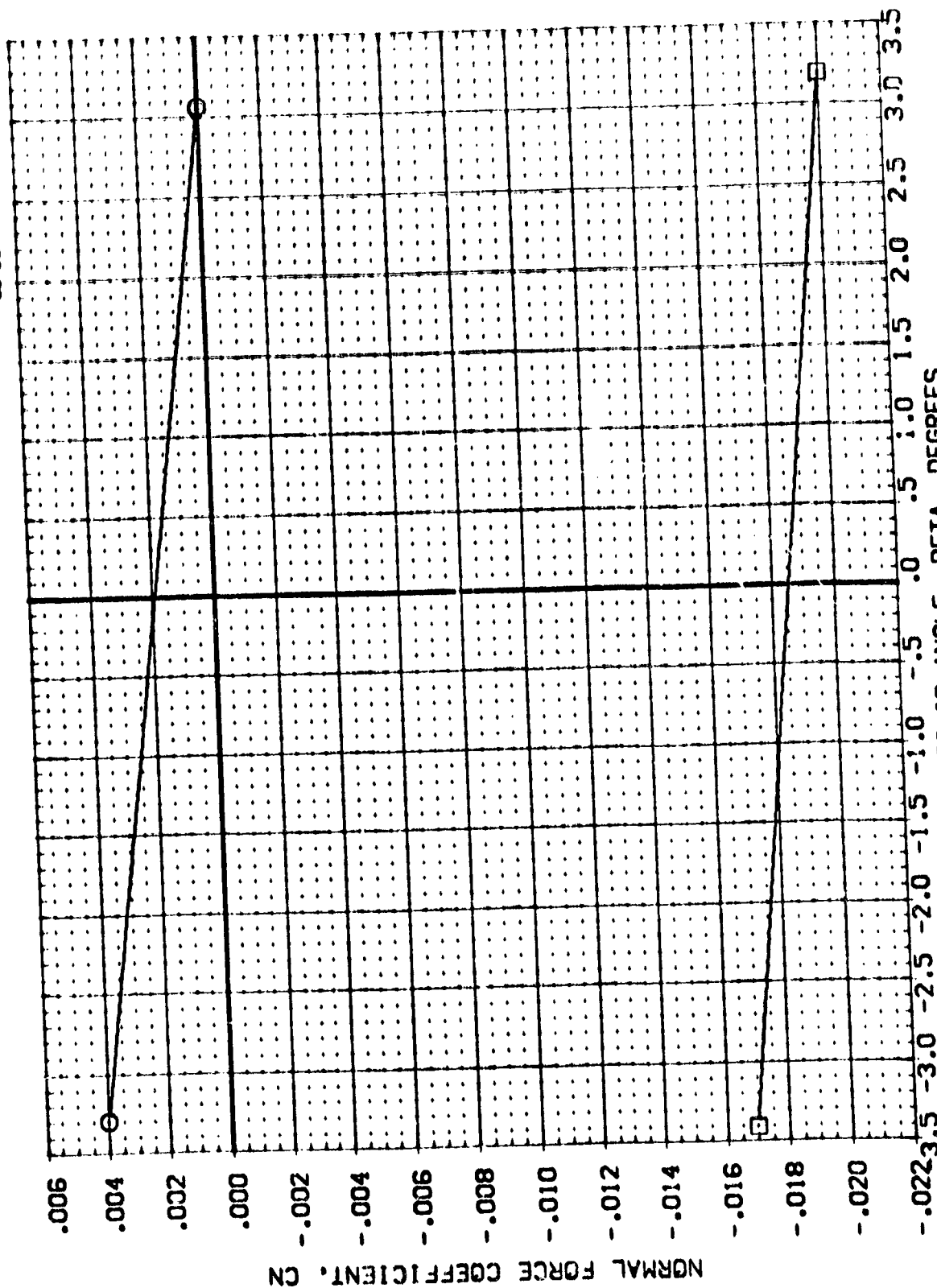
[illegible]

FIG. 50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5, 3.5

(R80002)

ES 87-707-CAI

SYMBOL MACH 2.498 3.502
 PARAMETER ALPHA .00 .00
 RUDDER .00 .00
 .000
 40.000

REFERENCE INFORMATION:
 REF 2.4710
 REF 39.8490
 REF 39.8490
 X-REF 30.3000
 Y-REF .0000
 Z-REF .0000
 SCALE .0000

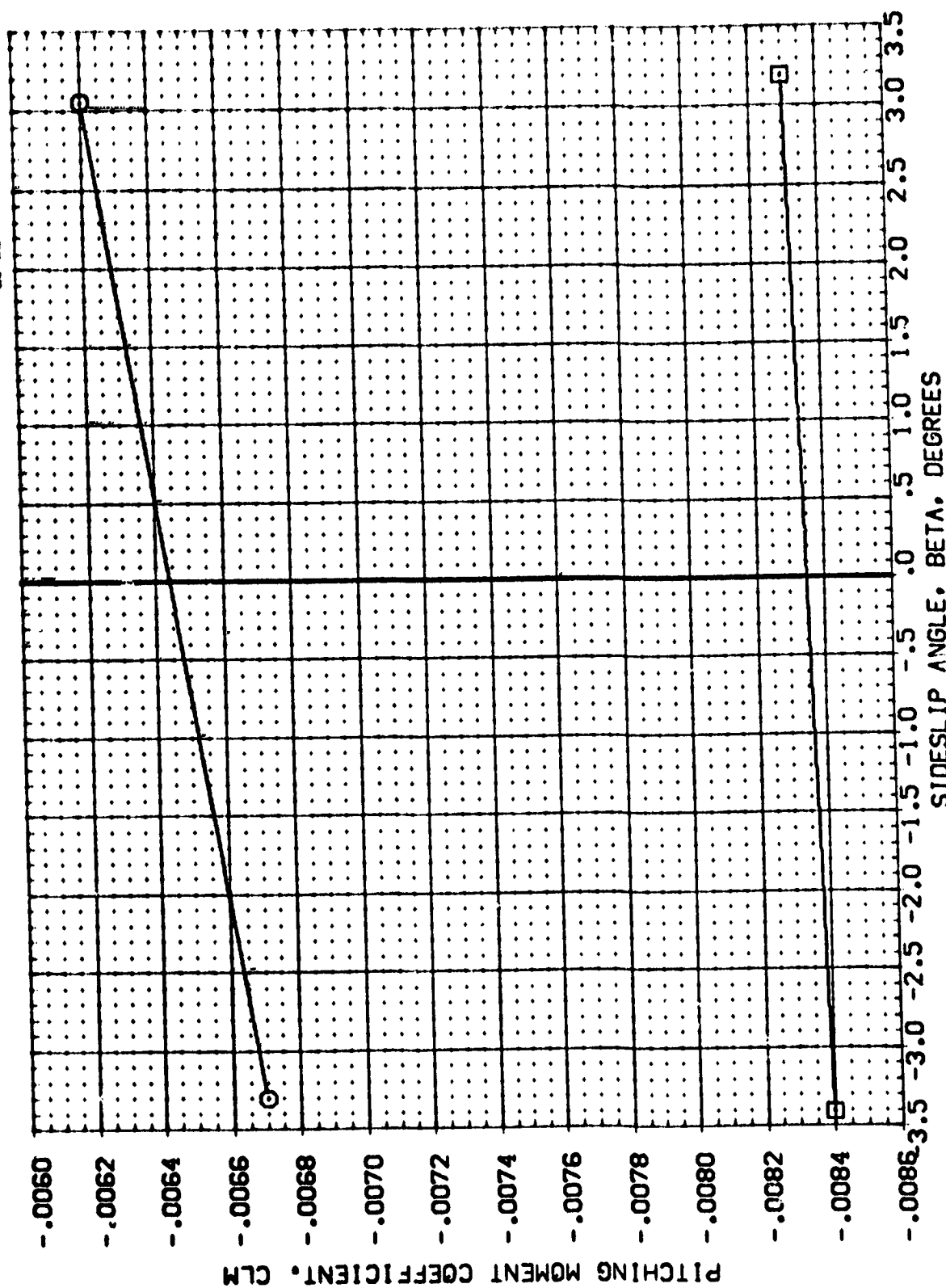


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

(RB0002)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDER
O 2.498
□ 3.502

PARAMETRIC VALUES
.000 ELEVON
.000 RUFLR
40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

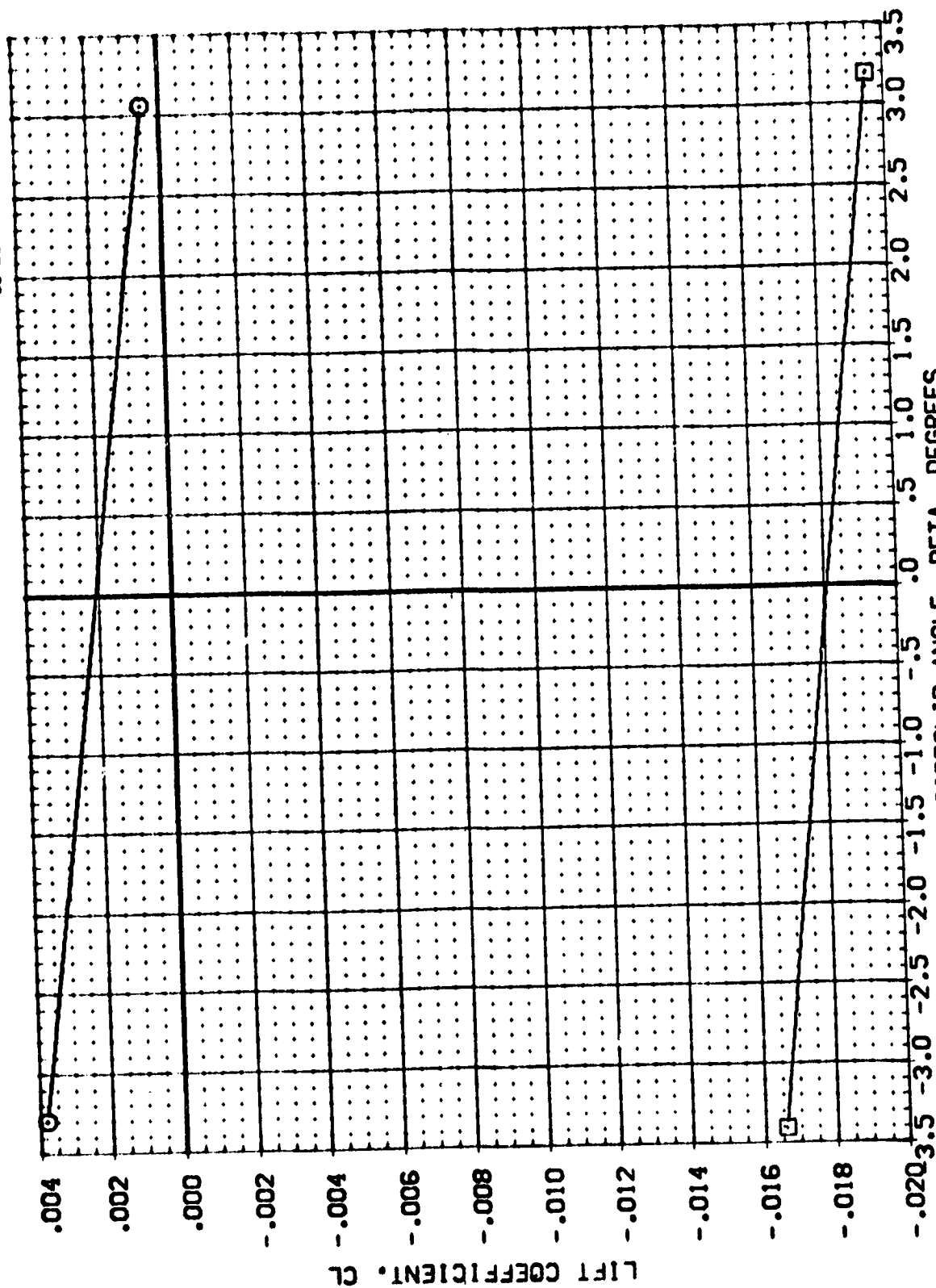


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

==

(R300002)

AVES 87-707-CA12 C2A

| | | | | |
|--------|-------|--------|-------------------|--------|
| SYMBOL | WACH | ALPHA | PARAMETRIC VALUES | |
| ○ | 2.498 | RADDER | .000 ELEVON | .000 |
| □ | 3.502 | | .000 ROLLER | 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.4210 | SCALE |
| LREF | 39.8190 | |
| BREF | 39.8190 | |
| XWPP | 32.3000 | |
| YWPP | 10.0000 | |
| ZWPP | 10.0000 | |
| SCALE | 10.0000 | |

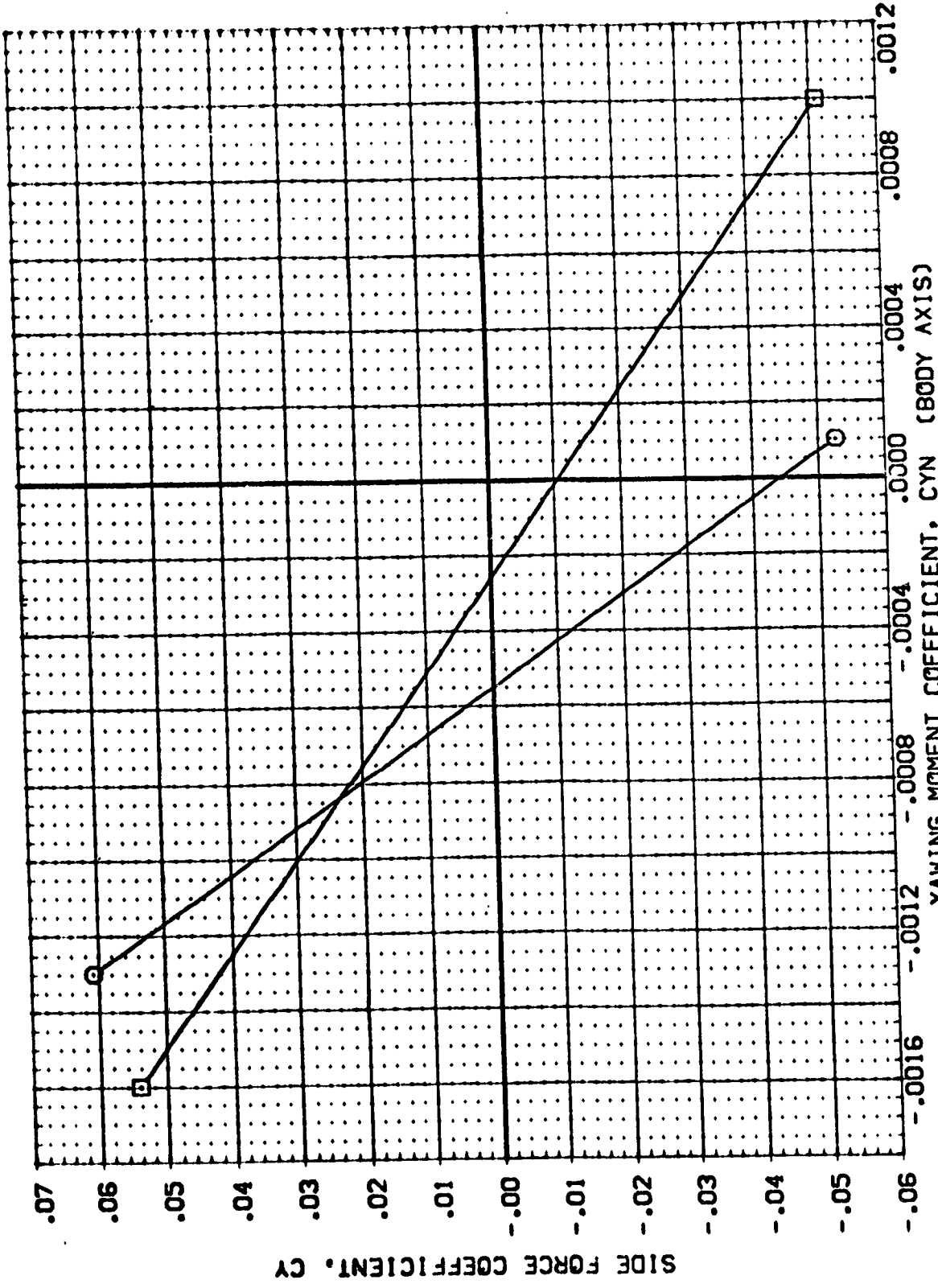


FIG.50 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0 DEGS., MN=2.5,3.5

(RB0003)

AVES 87-707-CA12 C2A

SYMBOL WACH ALPHA RUDDER PARAMETRIC VALUES
 1.00 2.498 3.502 10.000 10.000 10.000
 1.00 3.502 10.000 10.000 10.000 10.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 YREF 32.3000
 ZREF 0.0000
 SCALE 0.0000

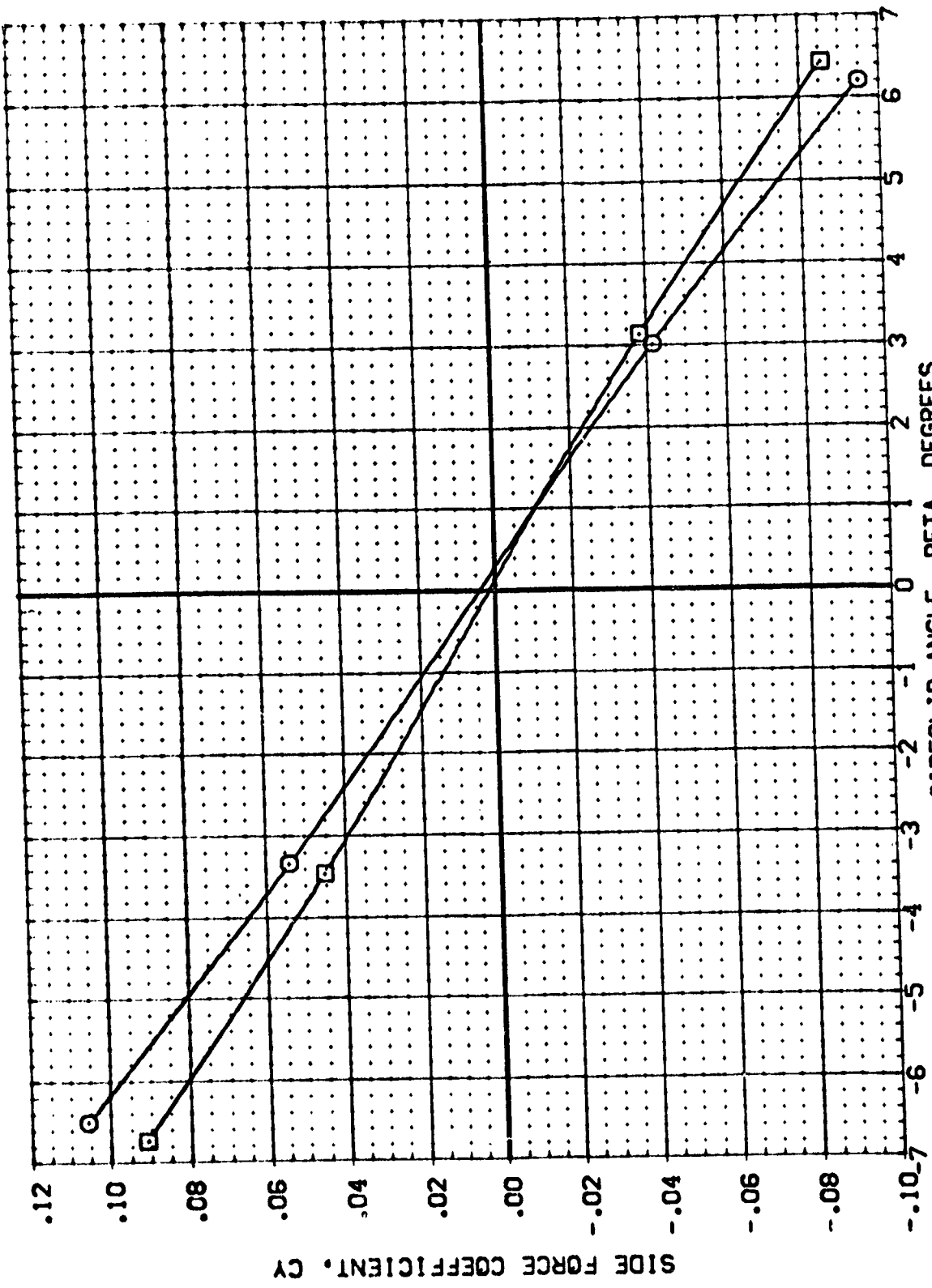


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

(RB00003)

AMES 87-707-CA:2 02A

SYMBOL MACH ALPHA RUDDER
□ 2.498 10.000 ELEVON 40.000
□ 3.527 .000 ROLLER

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.0000
YPRP 0.0000
ZPRP 0.0000
SCALE 0.0000

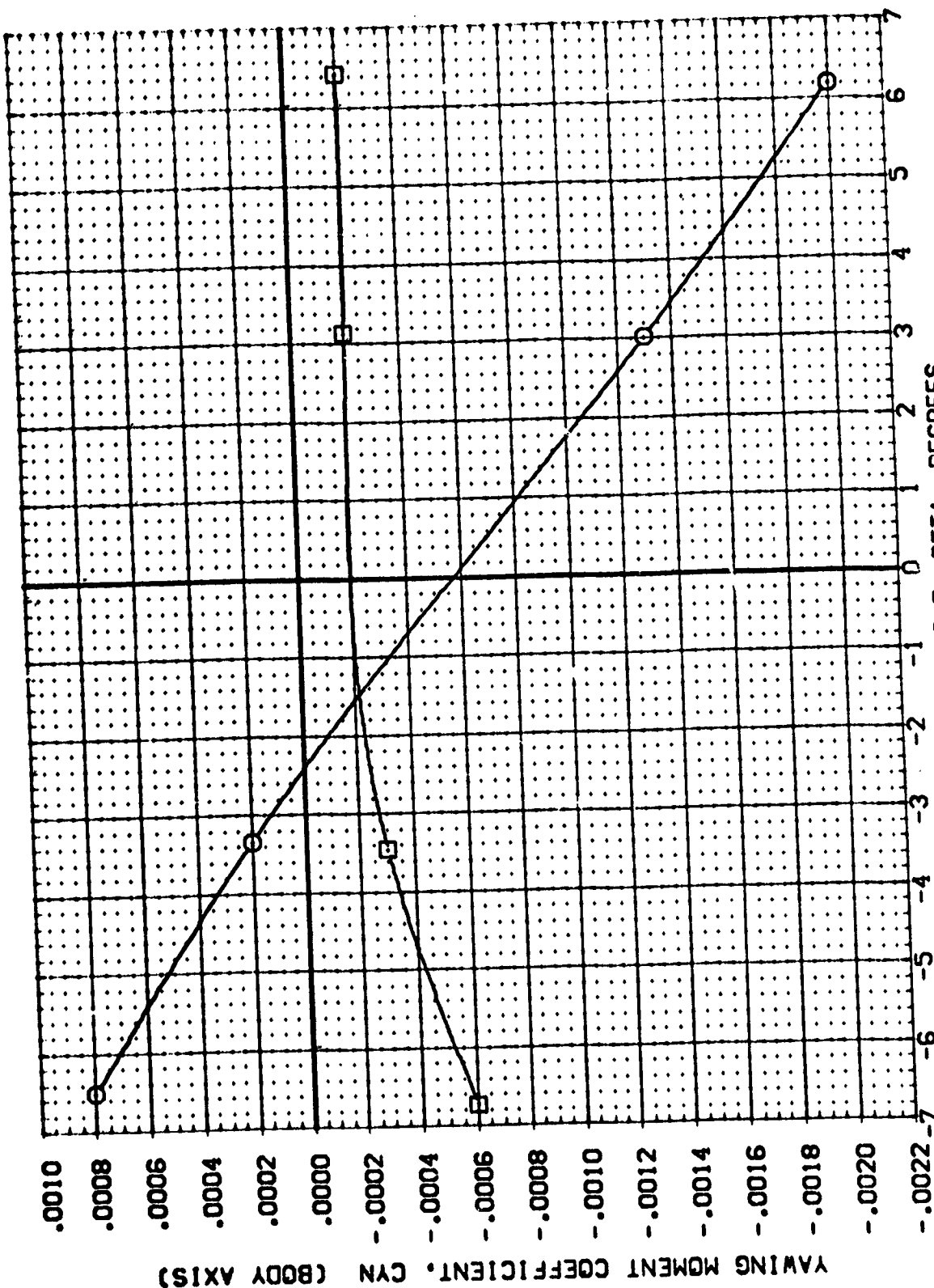


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

(RB00003)

AVES 87-707-CA12 02A

| SYMBOL | | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| MACH | 2.498 | ALPHA | 10.000 |
| RODIER | 3.502 | ELEVON | .000 |
| | | R.O.F.L.R | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0000 |

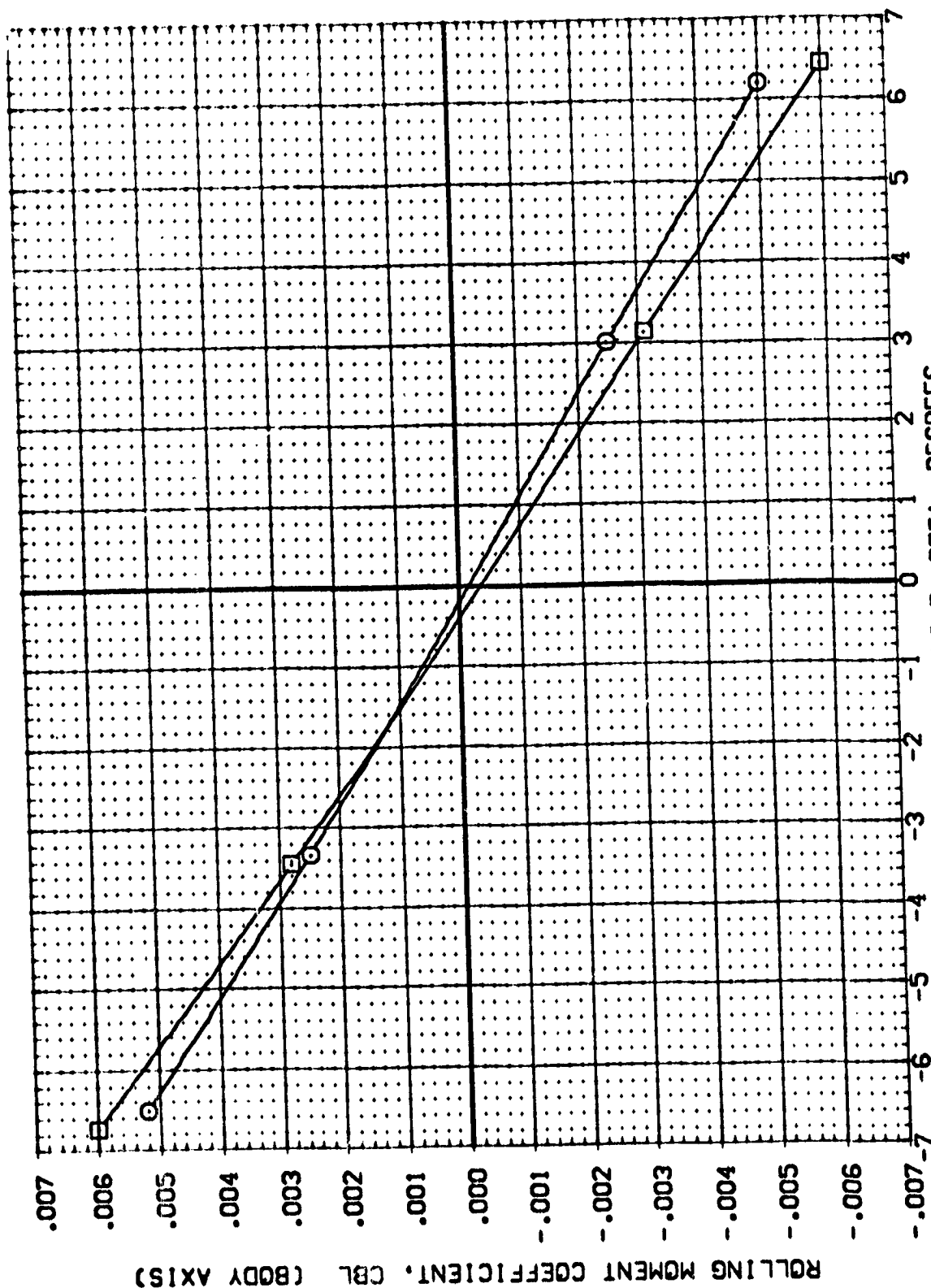


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

(RBG003)

AMES 87-707-CA12 32A

SYMBOL MACH ALPHA ROLLER PARAMETRIC VALUES
 10.000 ELEVON .000
 3.502 ROLLER .000 ROLLER 40.000

REFERENCE INFORMATION
 SREF 2.4213
 LREF 38.8490
 BREF 38.8490
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0000

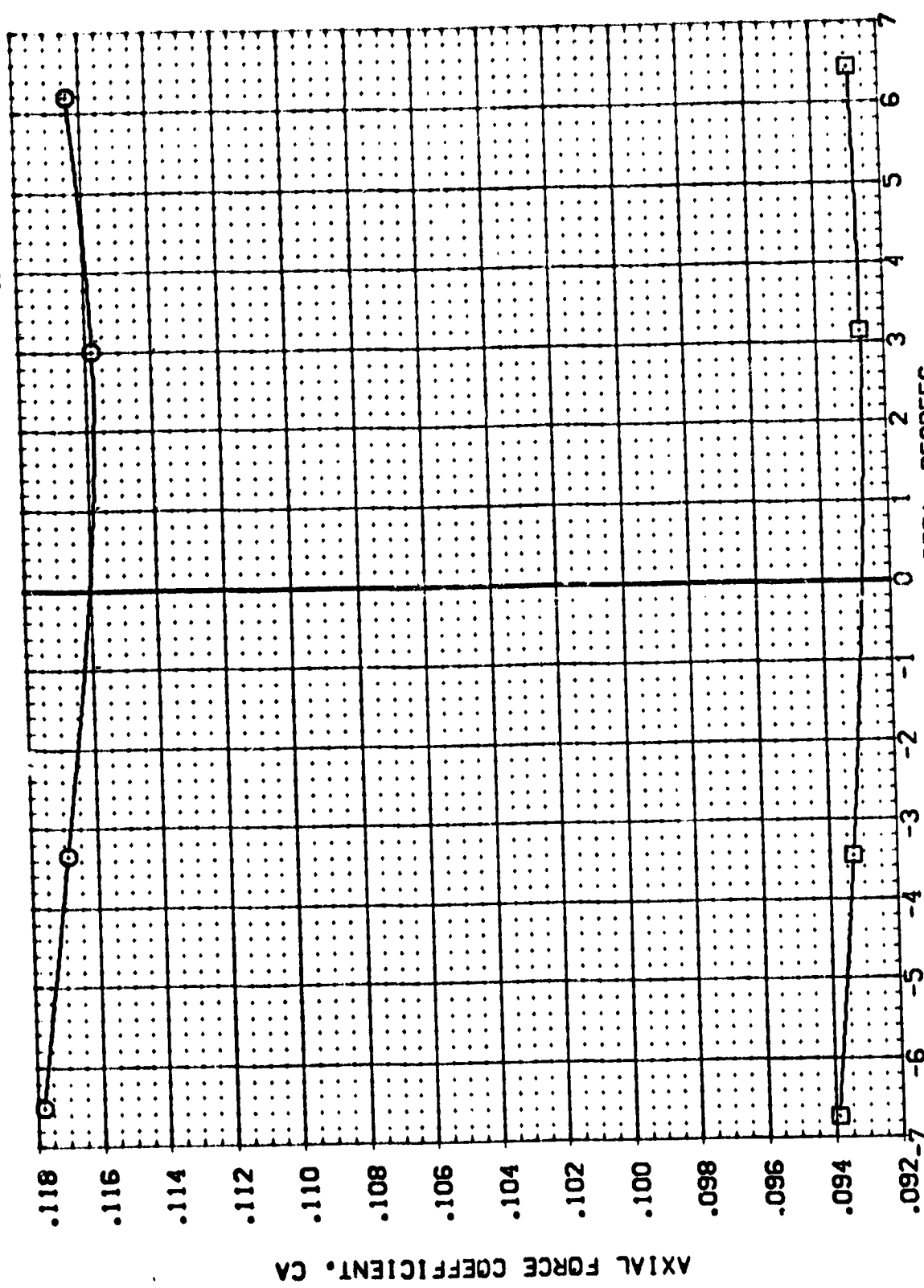


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

(RB0003)

AVES 87-707-0A12 02A

SYMBOL MACH ALPHA RUDDER PARMETRIC VALUES ELEVON RUDFLR .000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPROP 32.3000
YPROP .0000
ZPROP .0000
SCALE .0000

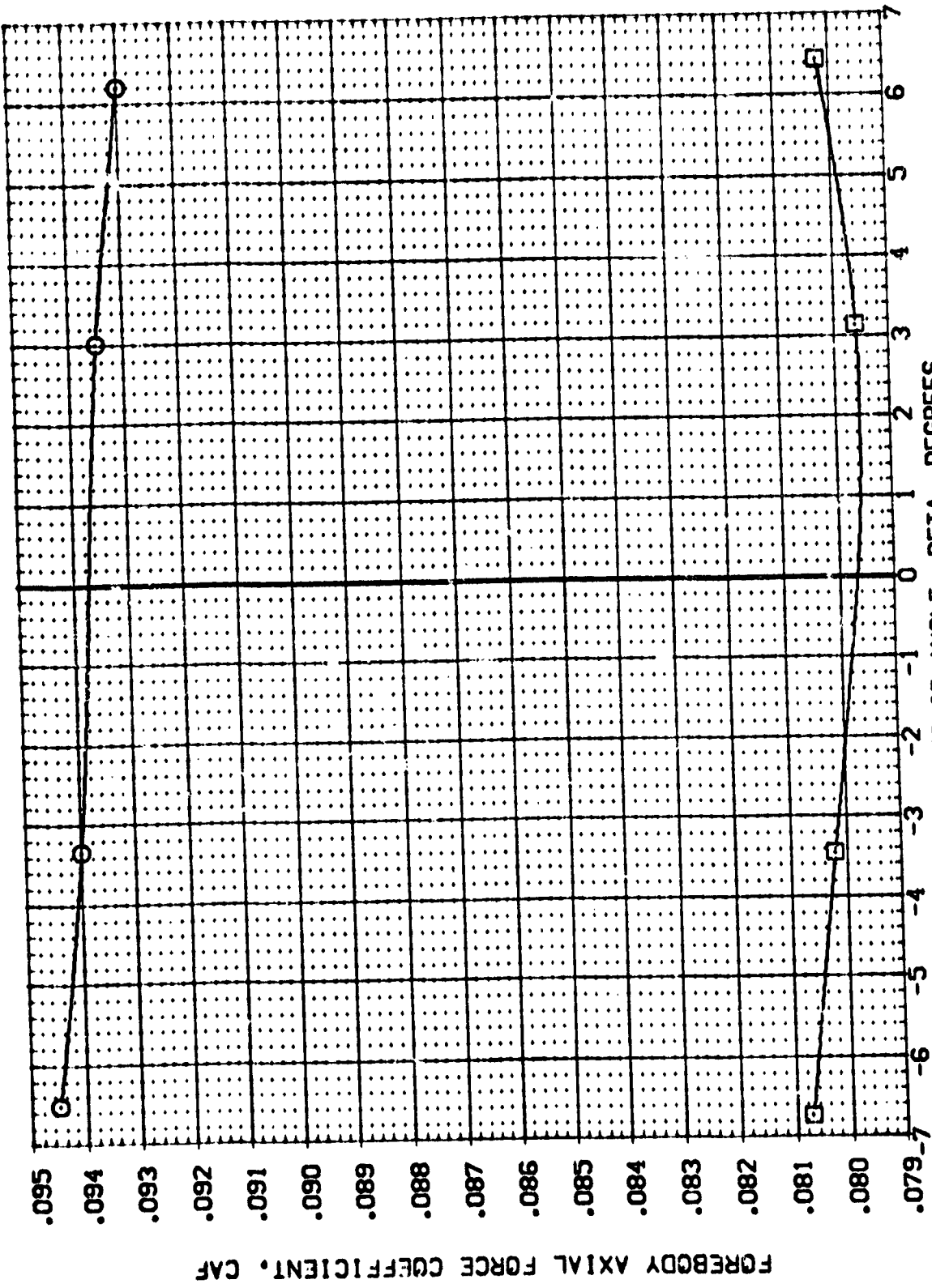


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

(R30003)

AVES 87-707-CA:2 C2A

SYMBOL: 2.498 3.502
PARAMETRIC VALUES: 10.000 .000 .000
ALPHA: 10.000
ELEVON: .000
RUDDER: 40.000

REFERENCE INFORMATION:
SREF: 2.4210
REF: 39.8450
BREF: 39.8450
XREF: 32.3000
YREF: 32.3000
ZREF: 32.3000
SCALE: 1000

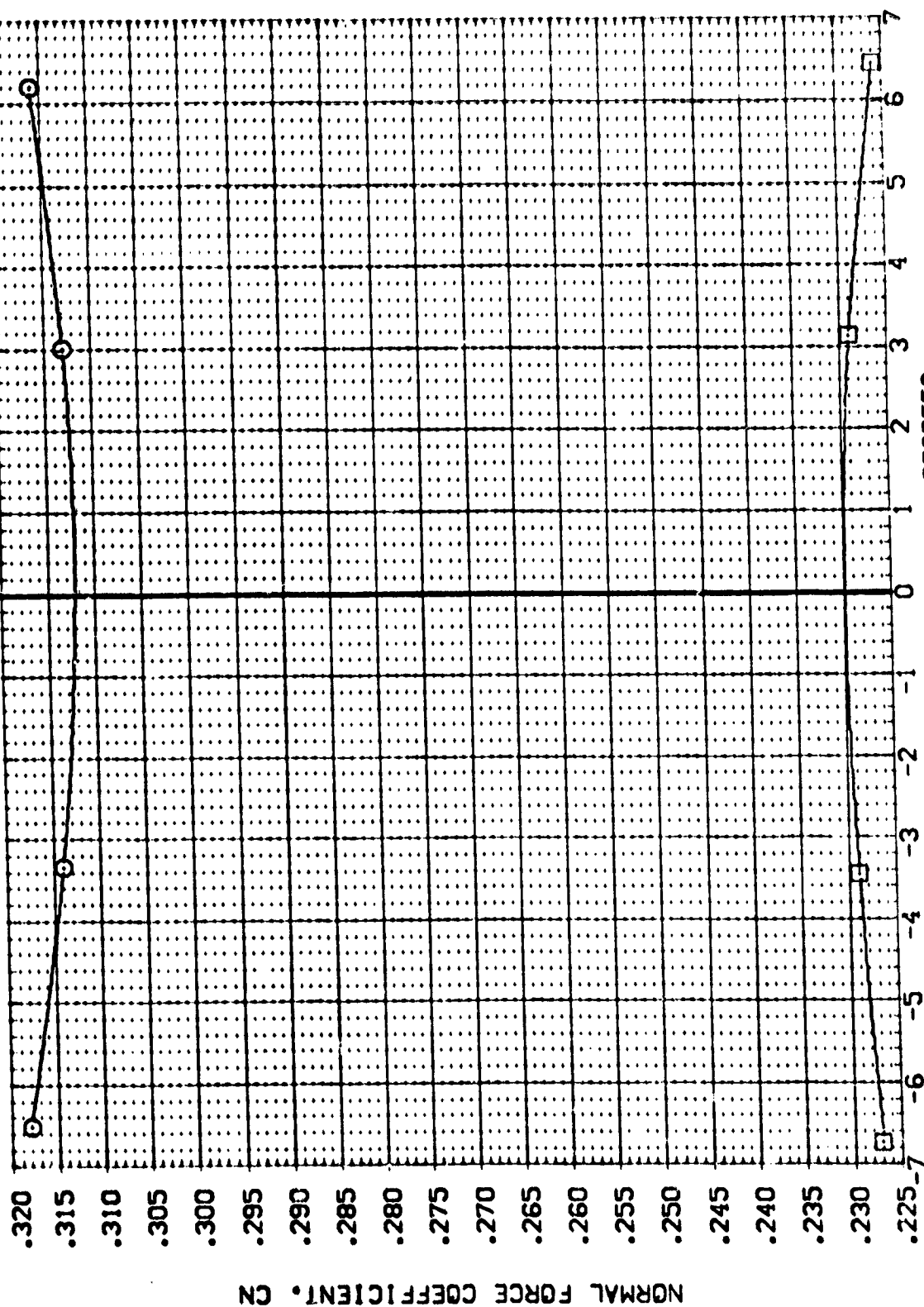


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=10 DEGS., MN=2.5,3.5

AVES 87-707-CA:2 C2A

(R88003)

SYMBOL: 2.498 ALPHA: 10.000 ELEV: .000
3.552 RUDDER: .000 ROLL: 40.000

PARAMETRIC VALUES

REFERENCE IN SPAN: 15
SHEET: 20.81.90
DATE: 20.81.90
BY: 20.81.90
APP: 20.81.90
SCALE: 1:1

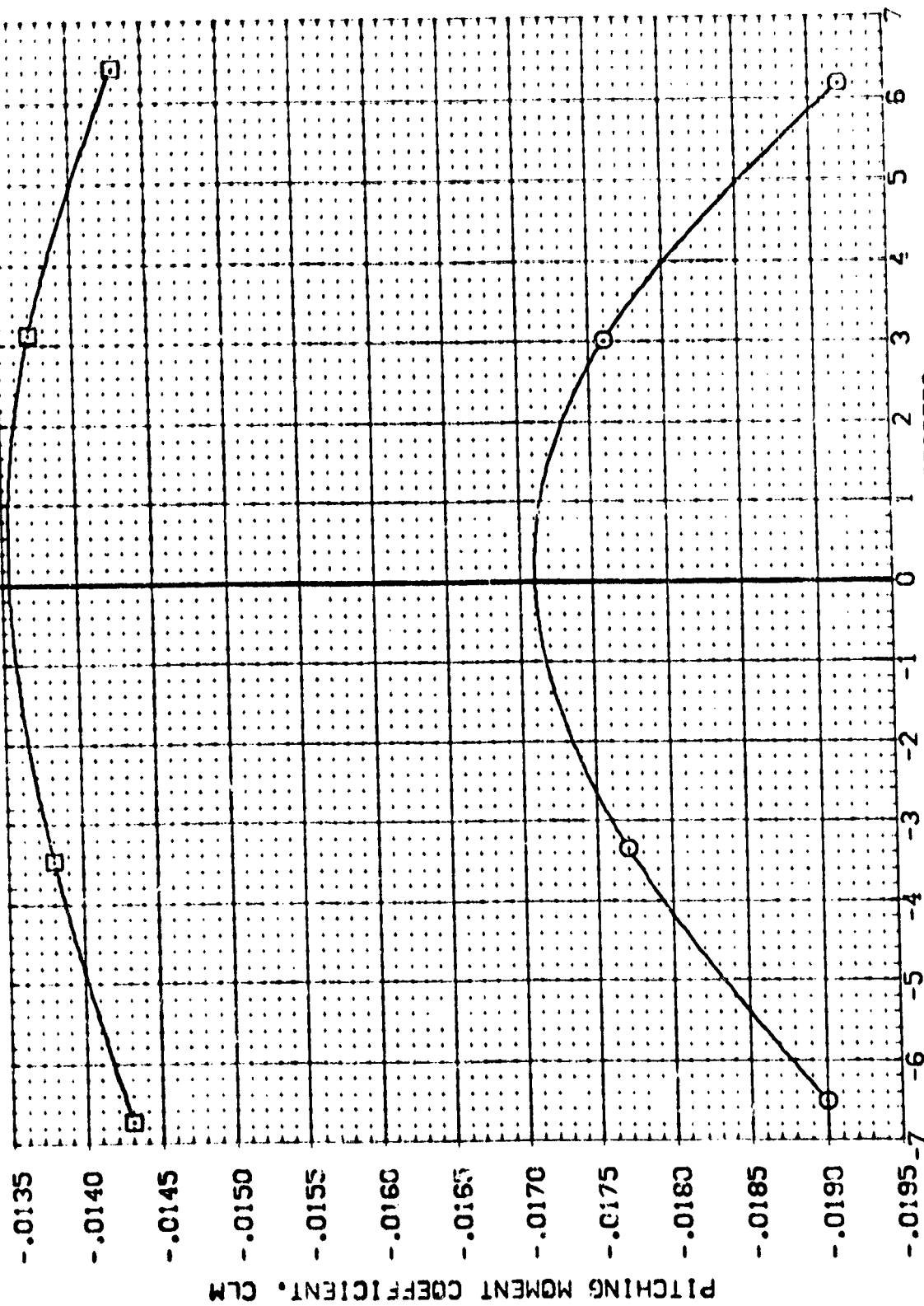


FIG.51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

AMES 87-707-CA:2

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| SYMBOL | NAME | PARAMETRIC VALUES |
|--------|-------|-------------------|
| () | ALPHA | 10.0000 |
| | BETA | 0.0000 |
| | MASS | 2.498 |
| | | 2.502 |
| | | 40.0000 |
| | | 0.0000 |

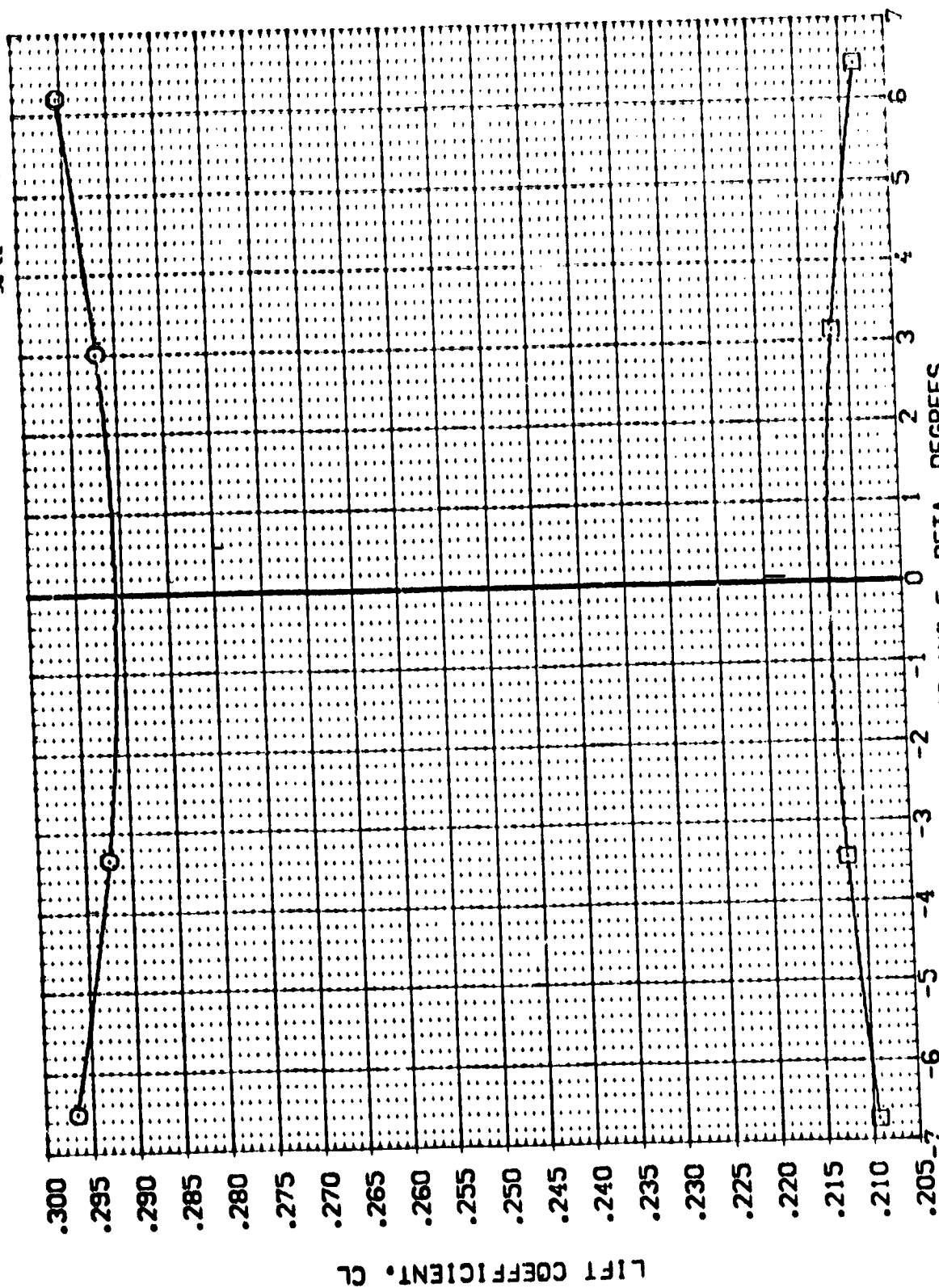


FIG. 51 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5, 3.5
SIDESLIP ANGLE, BETA, DEGREES

AVES 87-707-CA:2 C2A

(220003)

SYMBOL VAC-
2.498 ALPHA
3.502 RPODER

PARAMETRIC VALUES
10.000 ELEVON
.000 ROLLR 40.000

REFERENCE INFORMATION
SYMBOL
2.498
3.502
10.000
0.000
40.000
SCALE

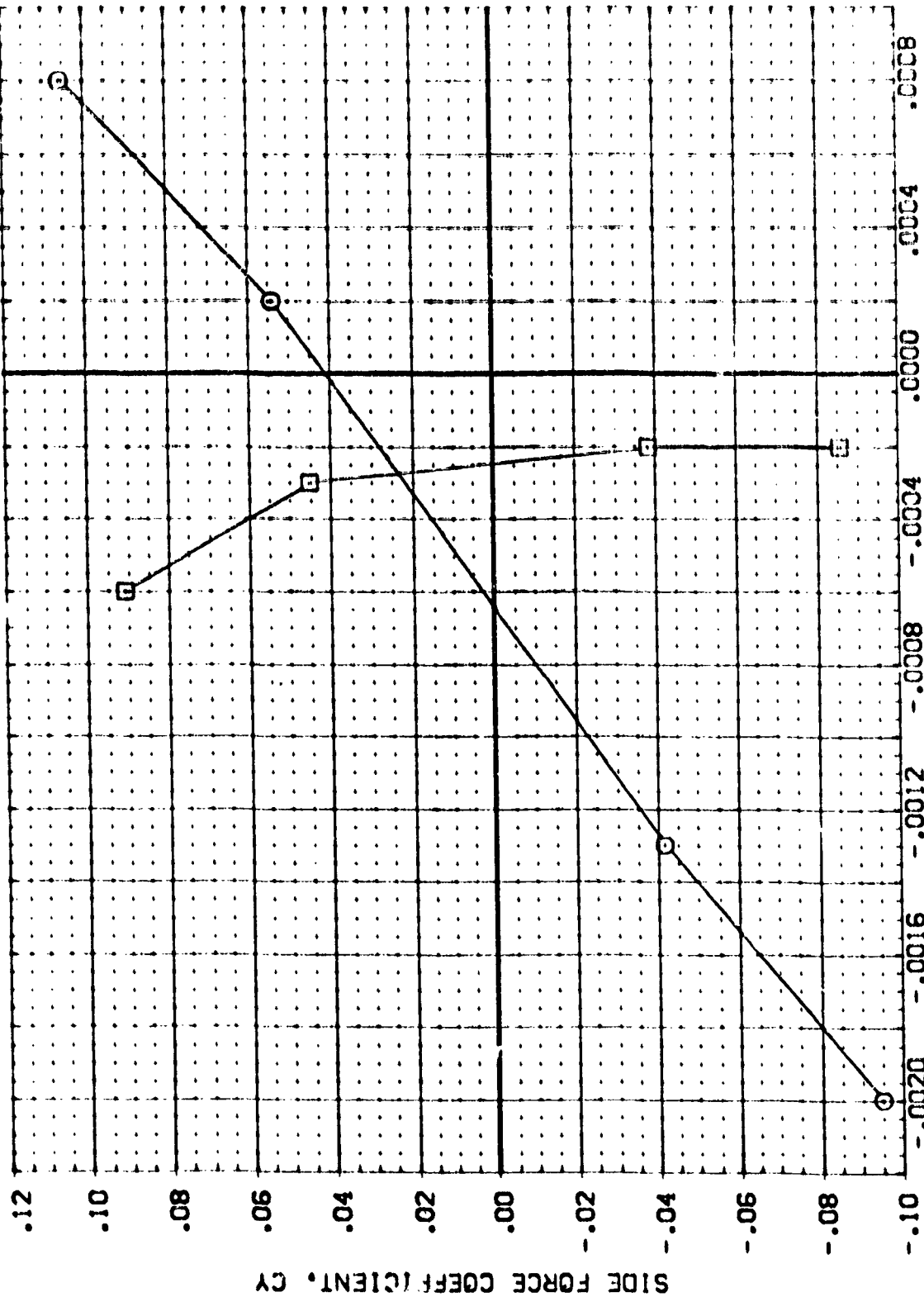


FIG.51 ORBITER LAT-01R. AERODYNAMIC DATA, ALPHA=10 DEGS., MN=2.5,3.5

AMES 87-707-CA12 C2A

(R80004)

SYMBOL MACH ALPHA RUDER PARMETRIC VALUES
 □ 2.498 3.502 20.000 .000 ELEVON RADFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 REF 39.819C
 SPEC 39.819C
 XREF 37.307C
 YREF 37.307C
 ZREF 37.307C
 SCALE 1.000
 SCALE 1.000

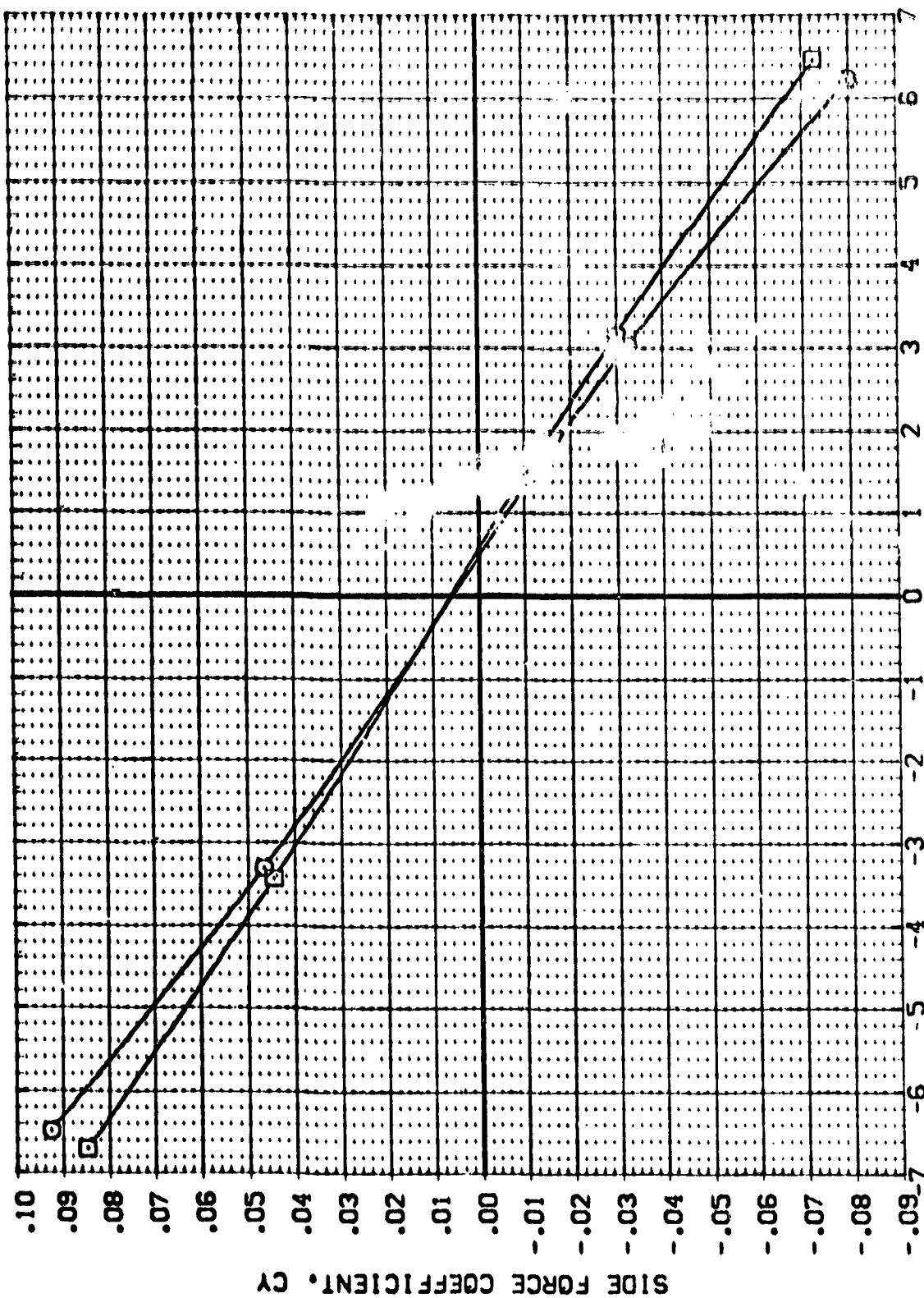


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=20 DEGS..MN=2.5.3.5

(RB00004)

AMES 87-707-0A12 02A

| | | | | | |
|--------|-------|--------|-------------------|--------|--------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | .000 |
| □ | 2.498 | RUDDER | 20.000 | RJDLR | 40.000 |
| ○ | 3.527 | | .000 | | |

REFERENCE INFORMATION

| | | |
|-------|---------|---------|
| SREF | 2.4210 | SC.F.T. |
| L-REF | 39.849C | |
| BREF | 39.849C | |
| YREF | 32.3000 | |
| ZREF | .0000 | |
| SCALE | .0000 | |
| SCALE | .0000 | |

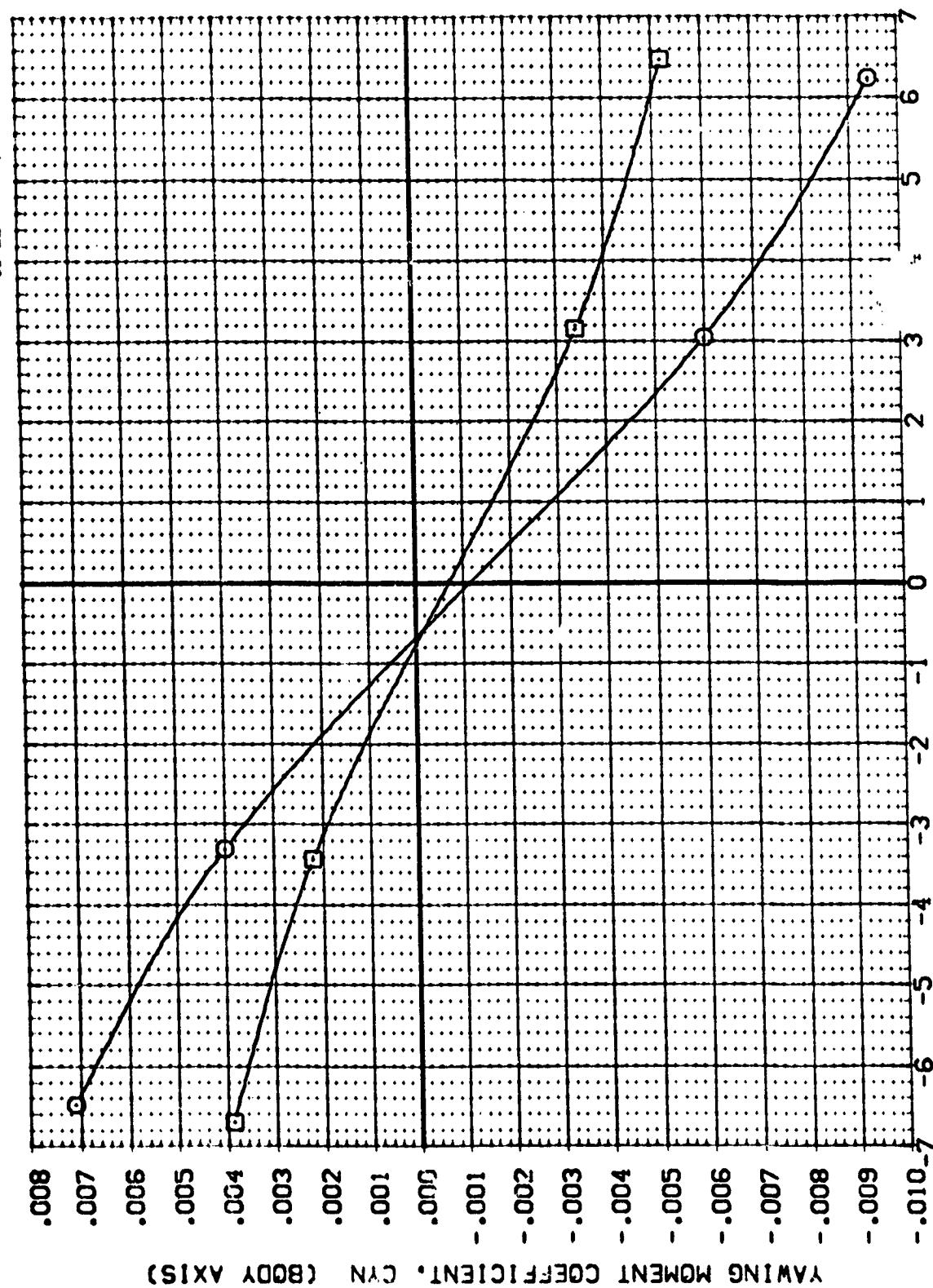


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20 DEGS., MN=2.5 5

(RBQ004)

AVES 87-707-0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON .000 .000
 2.498 3.502 20.000 20.000 RUGFLR 40.000

REFERENCE INFORMATION
SREF 2.4210 SC.F.
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

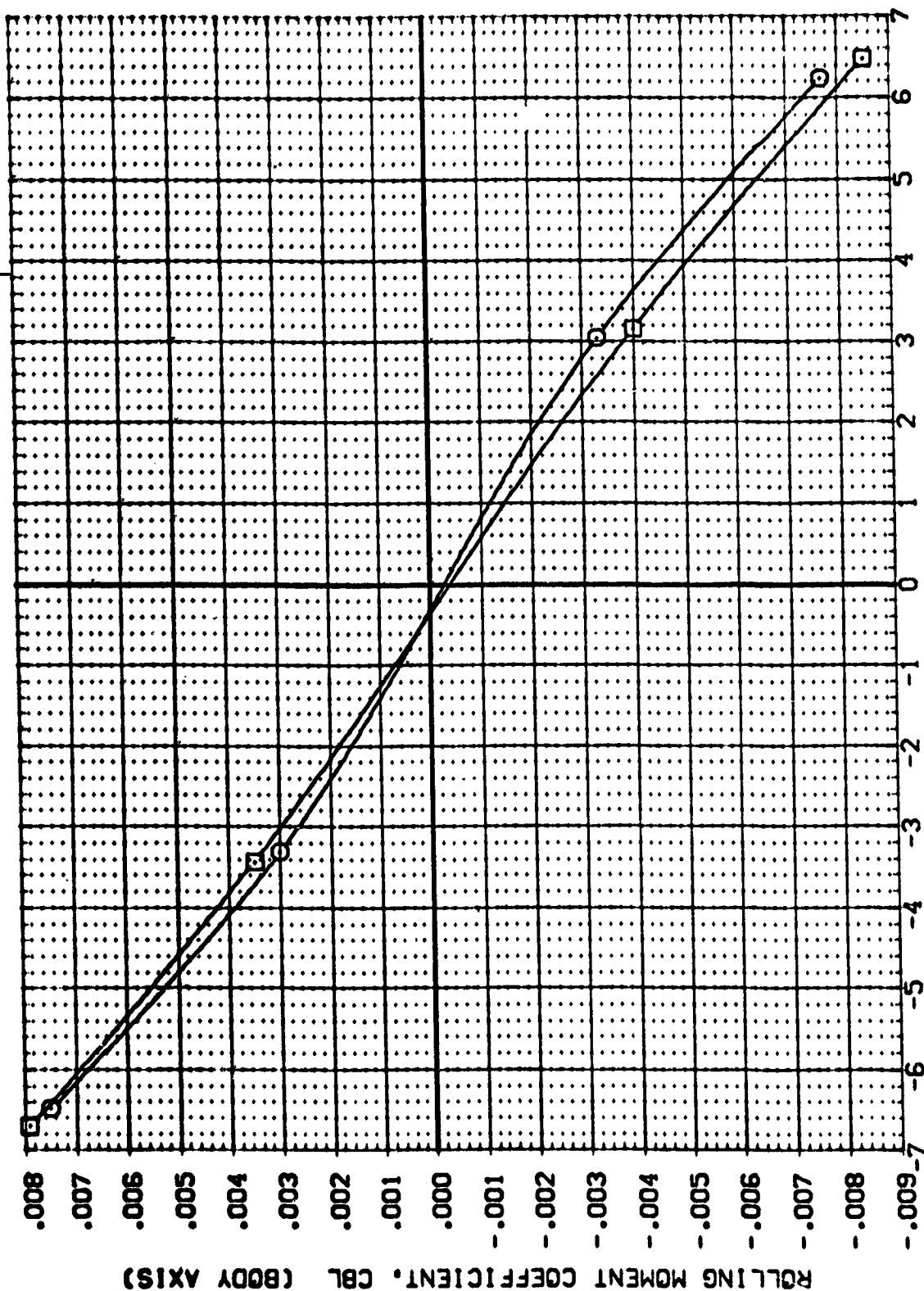


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20 DEGS., MN=2.5,3.5

(R80004)

AVES 87-707-CA:2 C2A

SYMBOL: 2.498 ALPHA 20.000 ELEVON .000
3.507 RUDDER .000 RUDFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.849C
BREF 39.849C
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0300

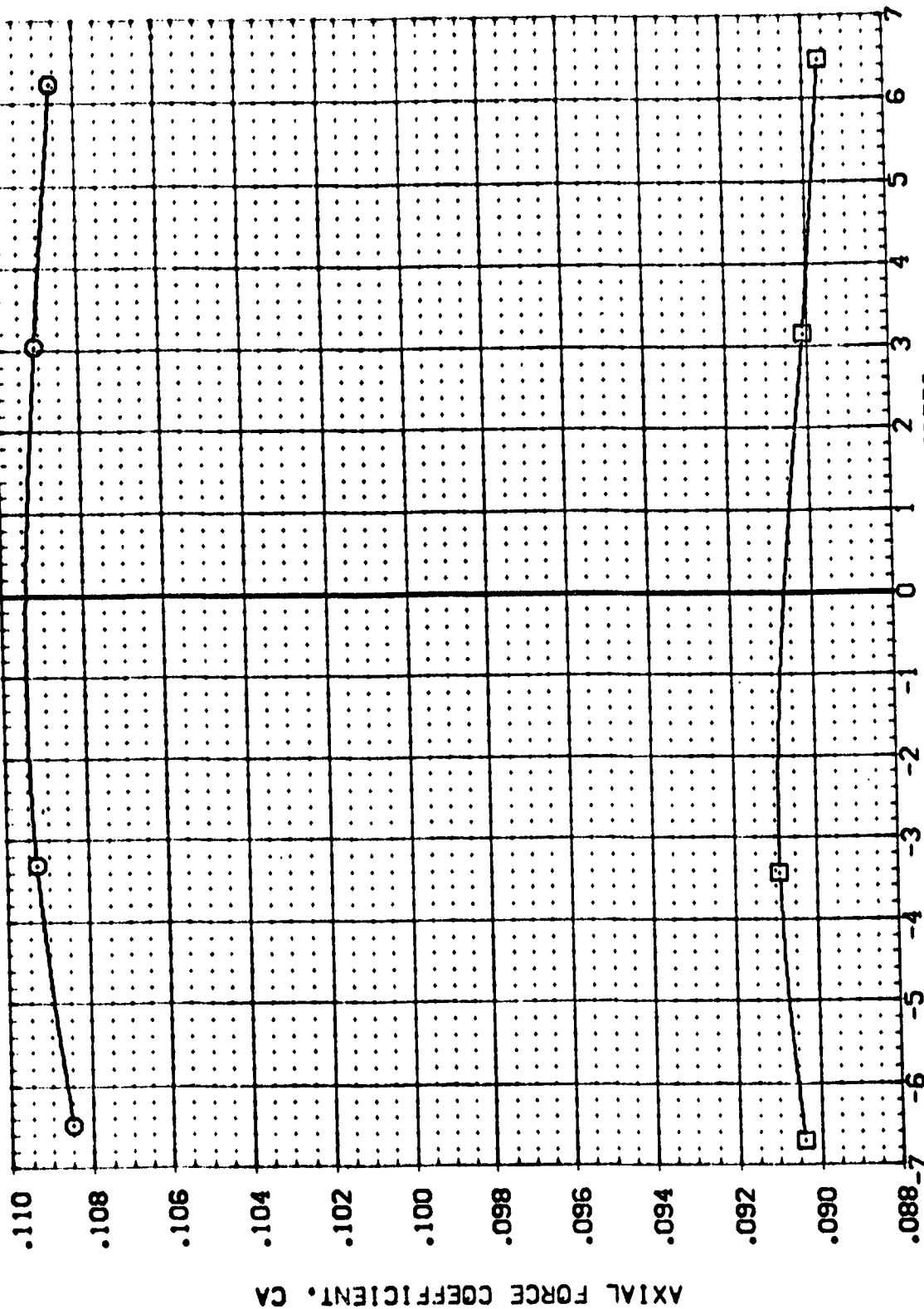


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20 DEGS., MN=2.5,3.5

AVES 87-707-CA12 GZA

(RB00004)

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVEN .000 R/OFLR 40.000

REFERENCE INFORMATION
SREF 2.4212
LREF 39.845C
BREF 39.845C
XMRP 32.3000
YMRP 0.0000
ZMRP 0.0000
SCALE 1.0000

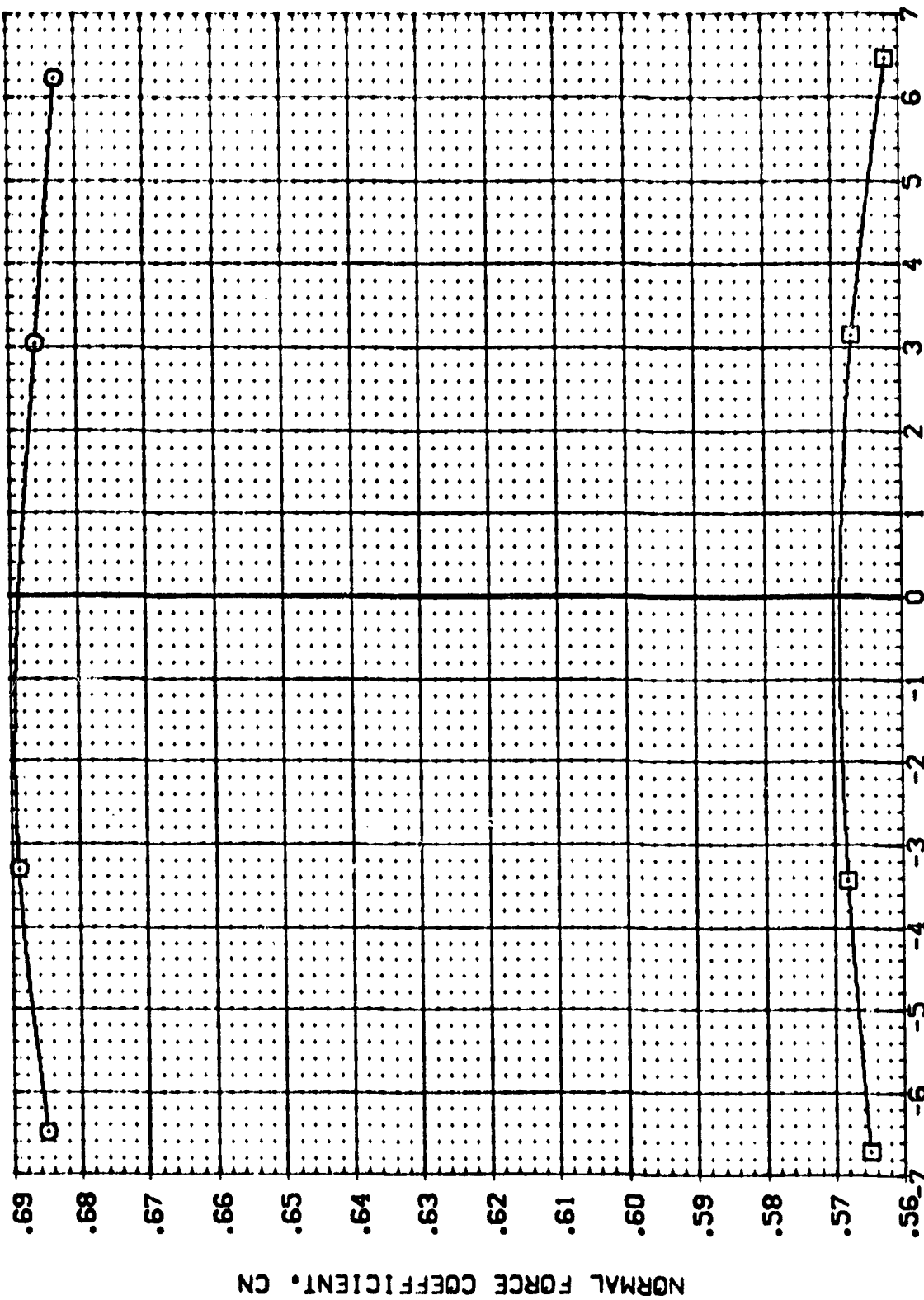


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20 DEGS., MN=2.5,3.5

AVES 87-707-CA12 02A

(RB0004)

SYMBOL WAC-
2.498 ALPHA
3.502 R-ORDER
PARAMETRIC VALUES
20.000 ELEVON
.000 R-FLR
40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 28.8190
BREF 33.8190
X-REF 32.3
Y-REF 32.3
Z-REF 32.3
SCALE

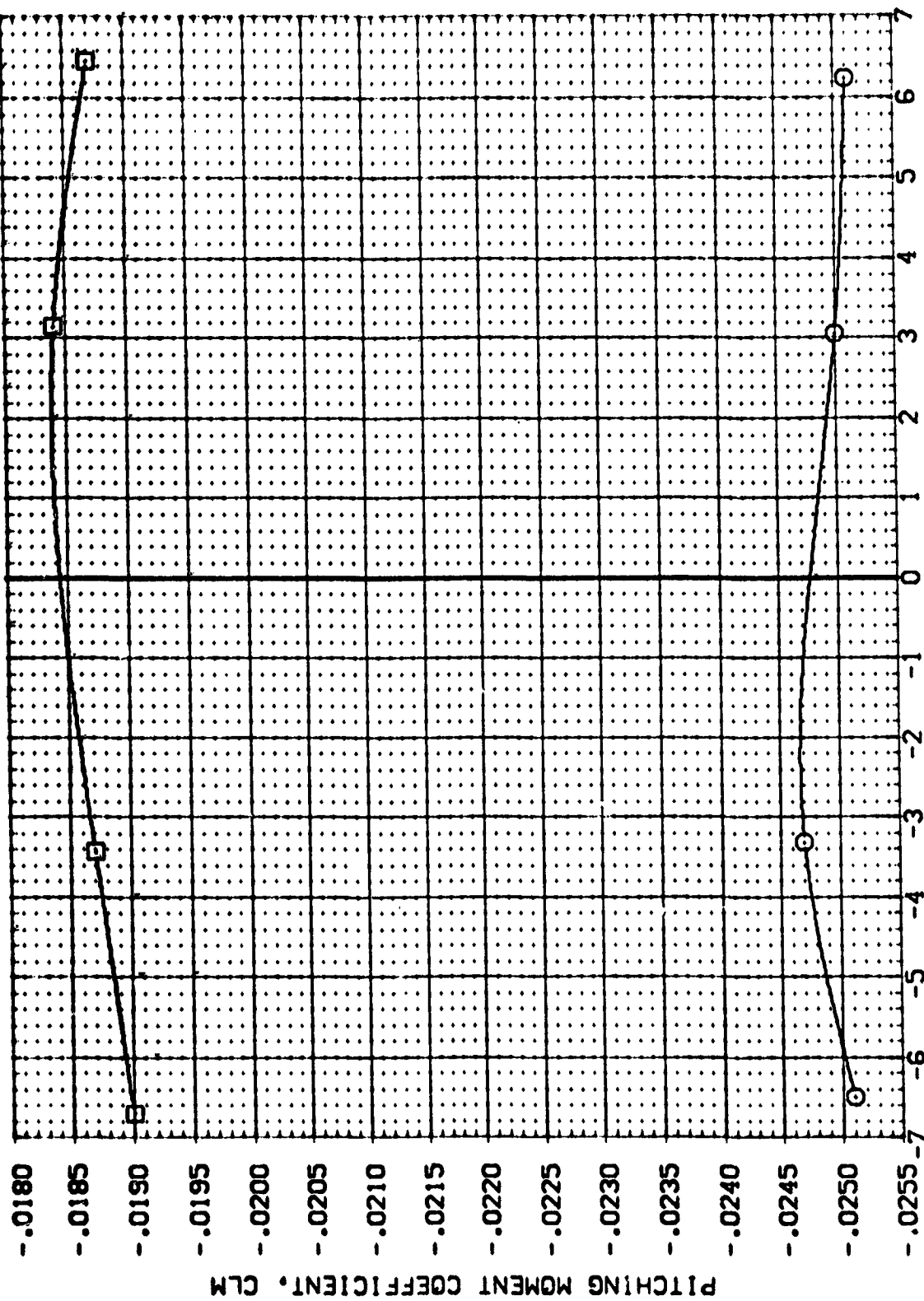


FIG.52 ORBITER LAT-OIR. AERODYNAMIC DATA, ALPHA=20 DEGS., MN=2.5,3.5

(RBG004)

AVES 87-707-CA12 C2A

| SYMBOL | MAC | ALPHA | PARAMETRIC VALUES | ELEVON | RUOFLR |
|--------|-------|--------|-------------------|--------|--------|
| | 2.498 | 20.000 | | .000 | 40.000 |
| | 3.502 | RODER | .000 | | |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.42:0 |
| LRP | 39.8490 |
| BRP | 39.8490 |
| XPRD | 32.0000 |
| YPRD | .0000 |
| ZPRD | .0000 |
| SCALE | .0300 |

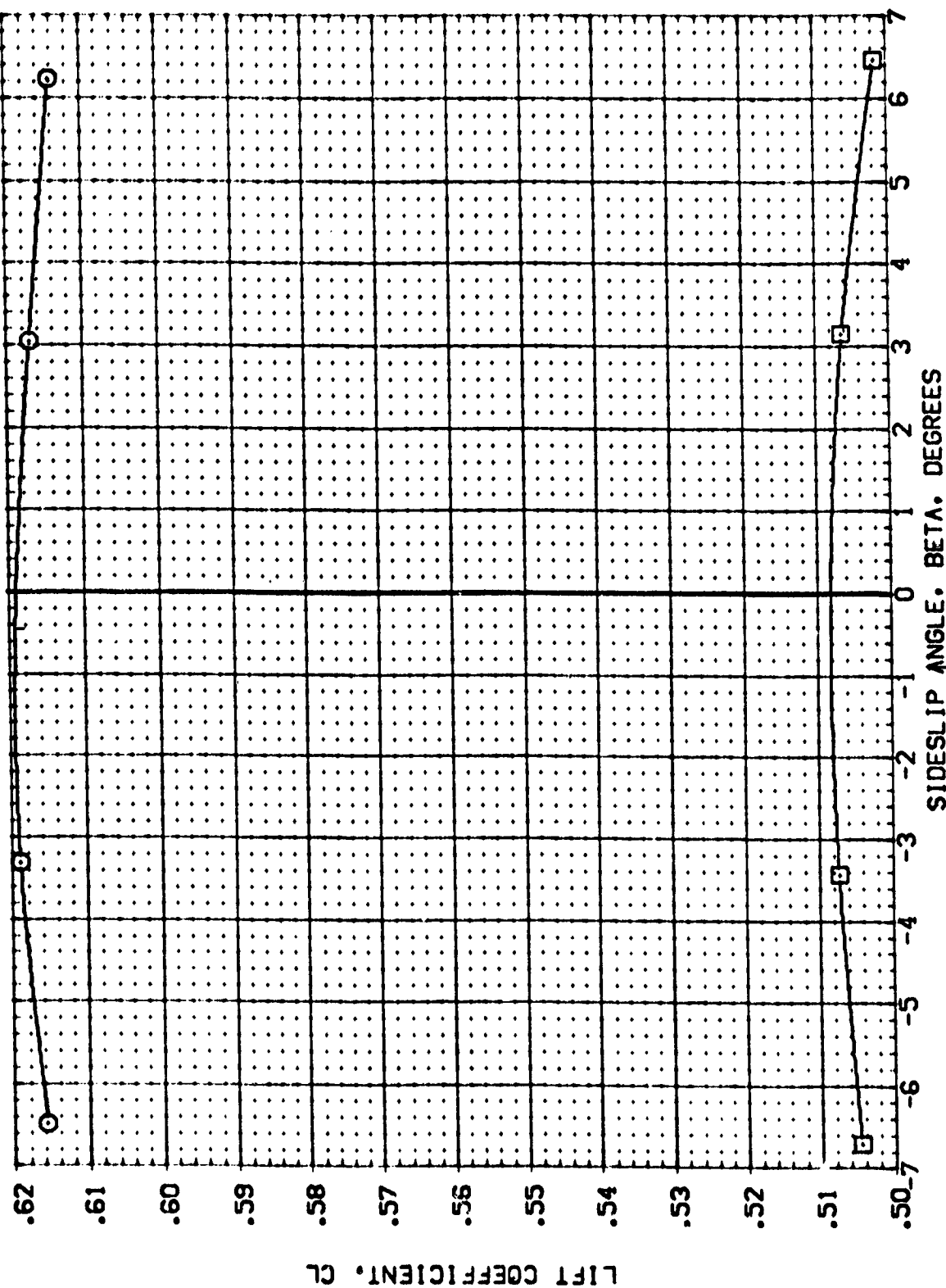


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=20 DEGS..MN=2.5.3.5

AVES 87-727-BA12 C2A

| SYMBOL | WACH | ALPHA | PARAMETRIC VALUES |
|--------------------------|-------|--------|-------------------|
| <input type="radio"/> | 2.498 | ELEVON | .000 |
| <input type="checkbox"/> | 3.502 | RUDDER | 40.000 |

| REF | REFERENCE | AFSPAN | DATE |
|-------|-----------|--------|--------|
| SREF | 2.4212 | | 2-1-54 |
| LREF | 30.8450 | | 2-1-54 |
| BREF | 30.8450 | | 2-1-54 |
| XREF | 37.3000 | | 2-1-54 |
| YREF | | | 2-1-54 |
| ZREF | | | 2-1-54 |
| SCALE | | | 2-1-54 |

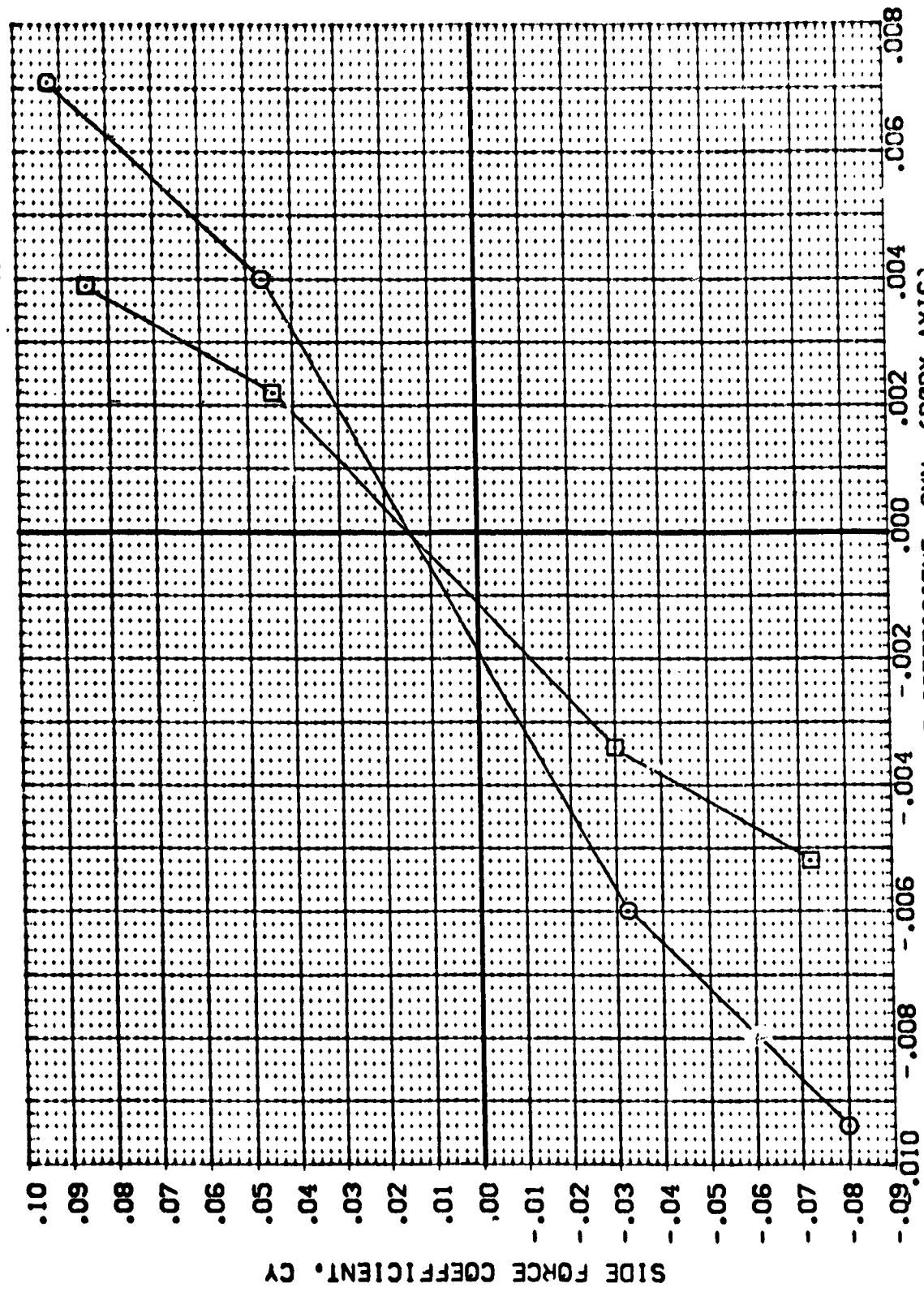


FIG.52 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=20 DEGS., MN=2.5,3.5

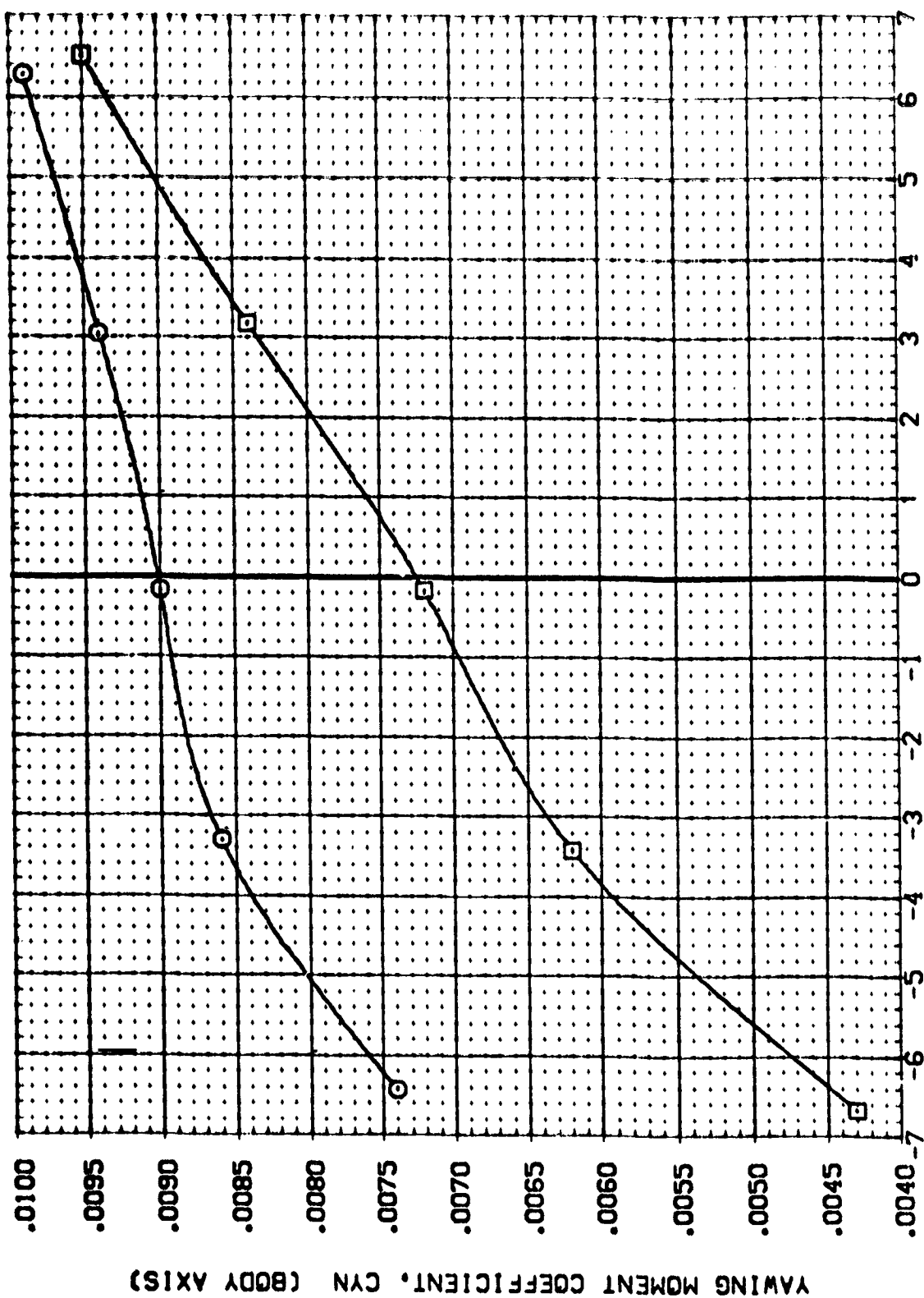
AMES 87-707-CA:2 C2A

(R33005)

SYMBOL PAC-
2.498
3.501

PARAMETRIC VALUES
ALPHA .000
ELEVON .000
RUDDER -20.000
RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 37.3000
YREF 1.0000
ZREF 1.0000
SCALE 1.0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5,3.5

AVES 87-707-CA12 02A

(R80005)

SYMBOL WACH- PARAMETRIC VALUES
 2.498 ALPHA .000 ELEVON .000
 3.501 RUDDER -20.000 RUOFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8150
 BREF 39.8150
 XMRP 32.0000
 YMRP 0.0000
 ZMRP 0.0000
 SCALE 1.0000

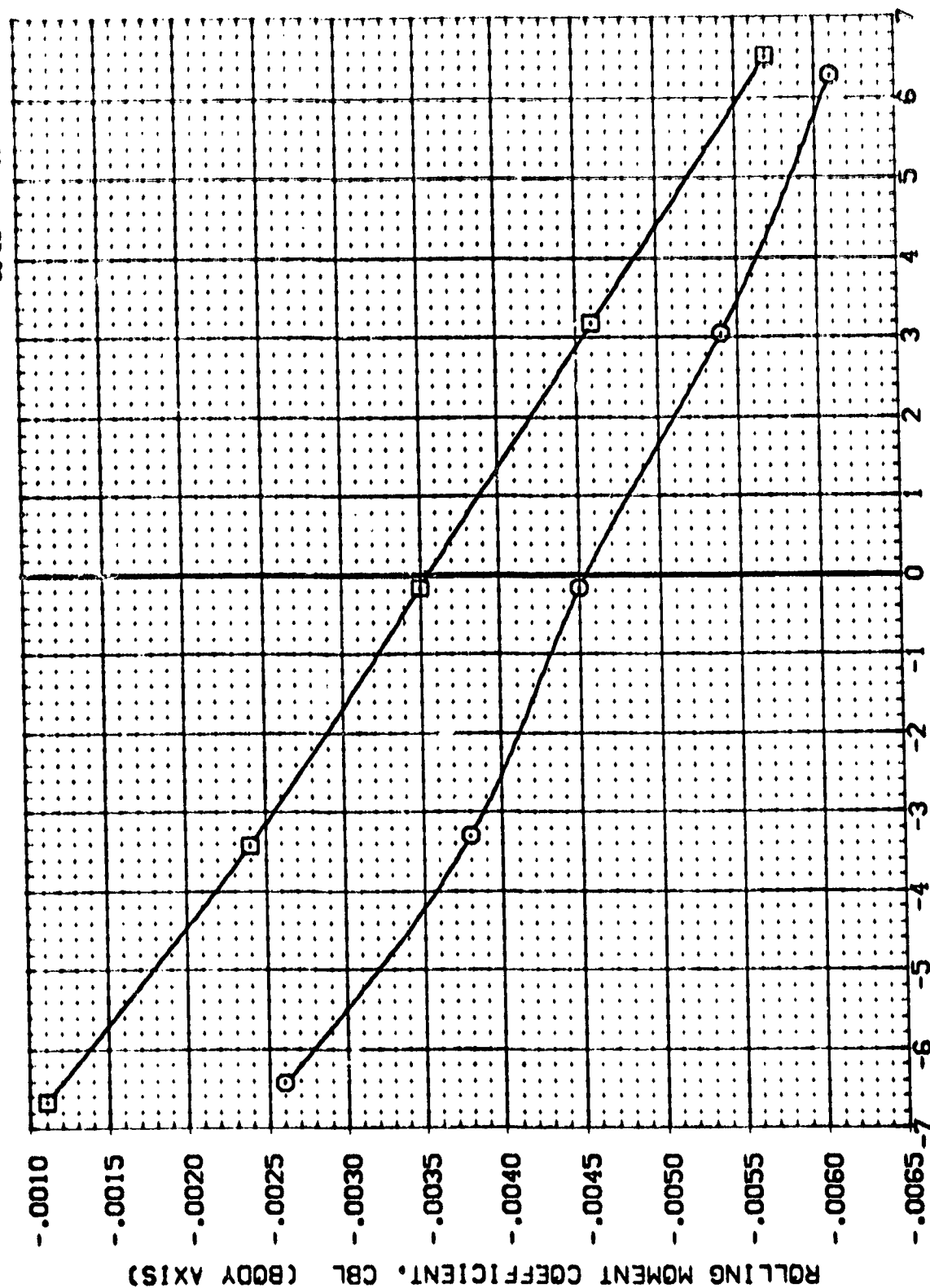


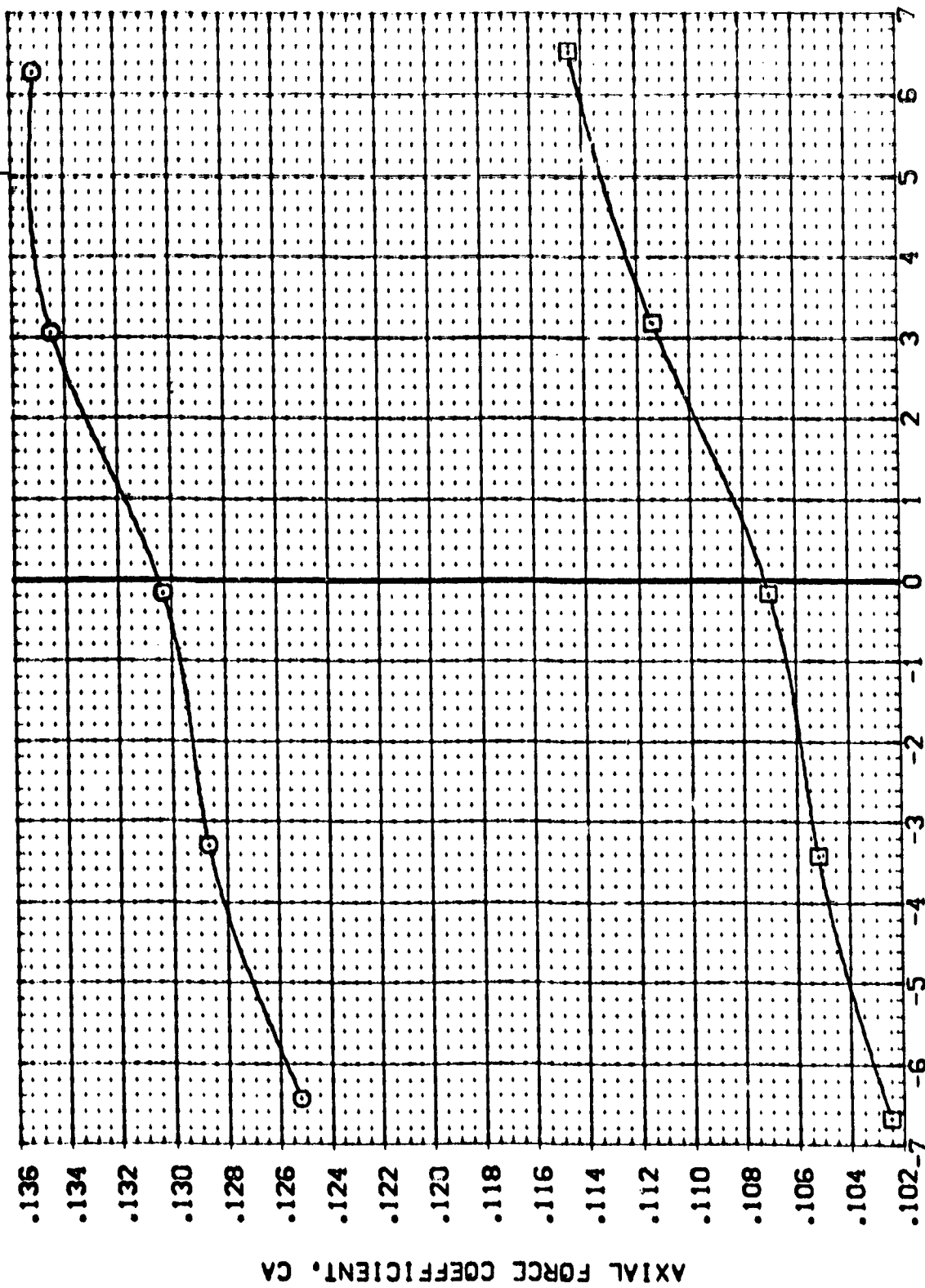
FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5,3.5

AVES 87-707-3A12 02A

(R80005)

SYMBOL WACH 2.499 3.500
 PARAMETRIC VALUES
 ALPHA .000 ELEVON .000
 RUDDER -20.000 RUDDER 40.000

REFERENCE INFORMATION
 SPEC 2.499
 LREF 28.815C
 BREF 28.815C
 XREF 27.300C
 YREF 27.300C
 ZREF 27.300C
 SCALE 1.000



SIDESLIP ANGLE, BETA, DEGREES

FIG. 53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5.3.5

(R83005)

AVES 87-707-CA12 32A

SYMBOL VAC- 2.498 3.501
PARAMETRIC VALUES
ALPHA .000
ELEVON .000
RUDDER -20.000
RUDDER 40.000

REFERENCE INFORMATION
SPE 2.4210
REF 38.8450
BPE 38.8450
KAP 32.3000
KAP 32.3000
KAP 32.3000
SCALE 10000
SCALE 10000

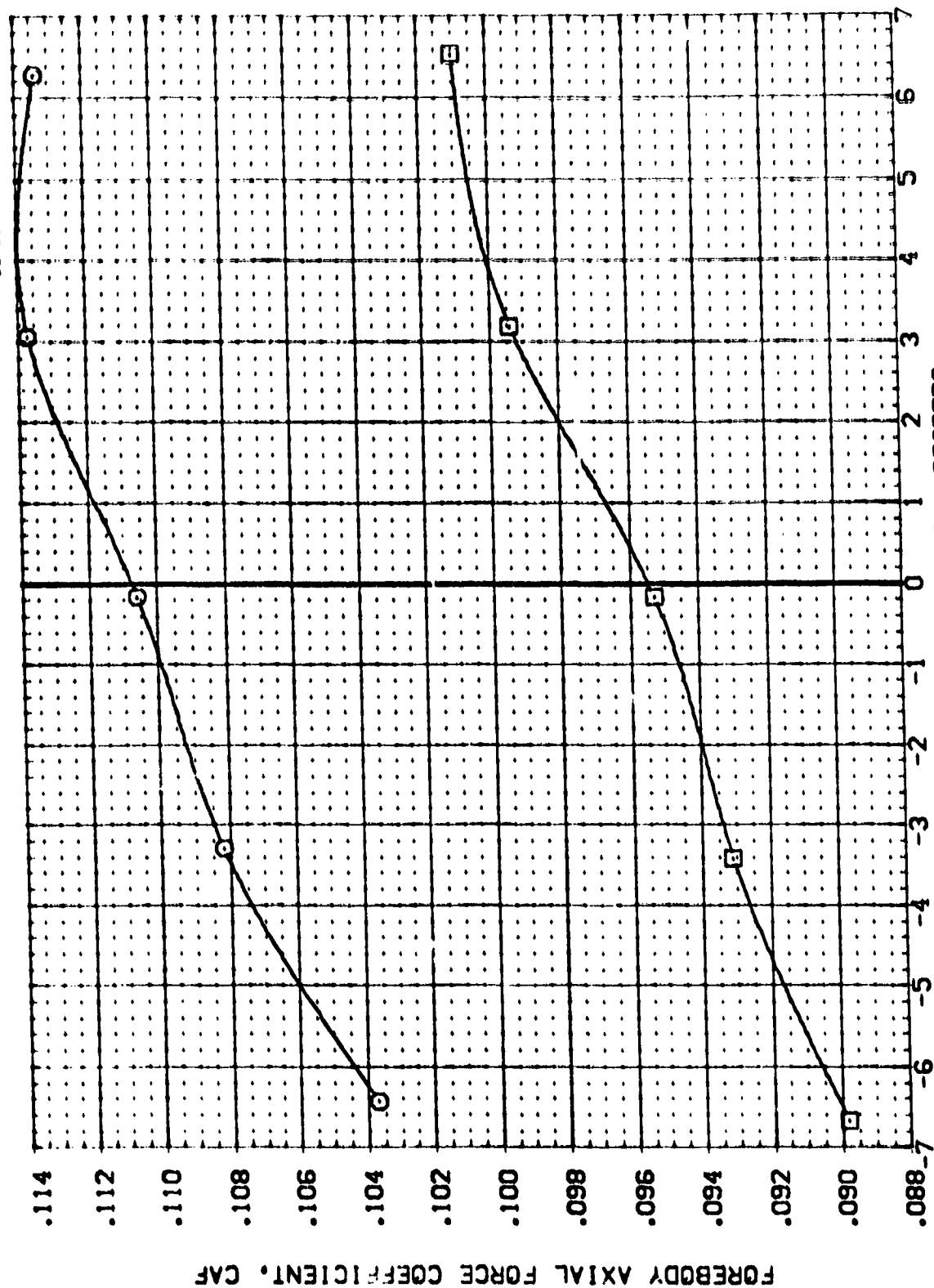


FIG.53 ORBITER LAT-OIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5, 3.5
PAGE 442

(R83005)

AVES 87-707-CA:2 02A

| SYMBOL | WACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDDER | 0.000 | 40.000 |
|--------|-------|-------|-------------------|--------|--------|-------|--------|
| ○ | 2.498 | 3.500 | -20.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| □ | 3.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

REFERENCE INFORMATION

| SYMBOL | WACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUDDER | 0.000 | 40.000 |
|--------|-------|-------|-------------------|--------|--------|-------|--------|
| ○ | 2.498 | 3.500 | -20.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| □ | 3.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

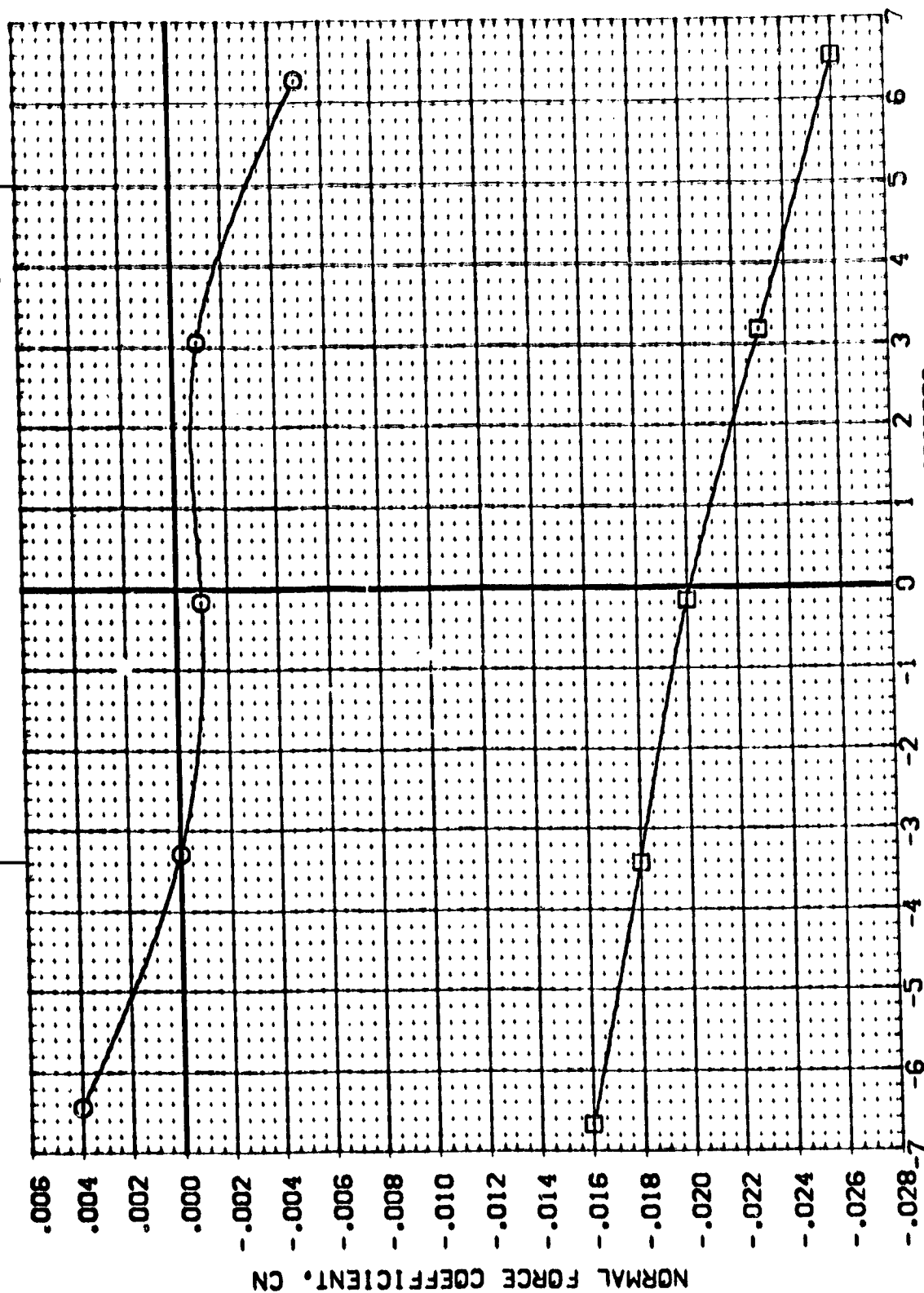


FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5, 3.5

AVES 87-707-CA:2 02A

(RBG005)

SYMBOL WACH
 2.498 ALPHA
 3.501 RUDDER
 PARAMETRIC VALUES
 .000 ELEVON
 -20.000 RUDDER
 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.849C
 BREF 39.849C
 XMRP 32.300C
 YMRP .0000
 ZMRP .0000
 SCALE .0300

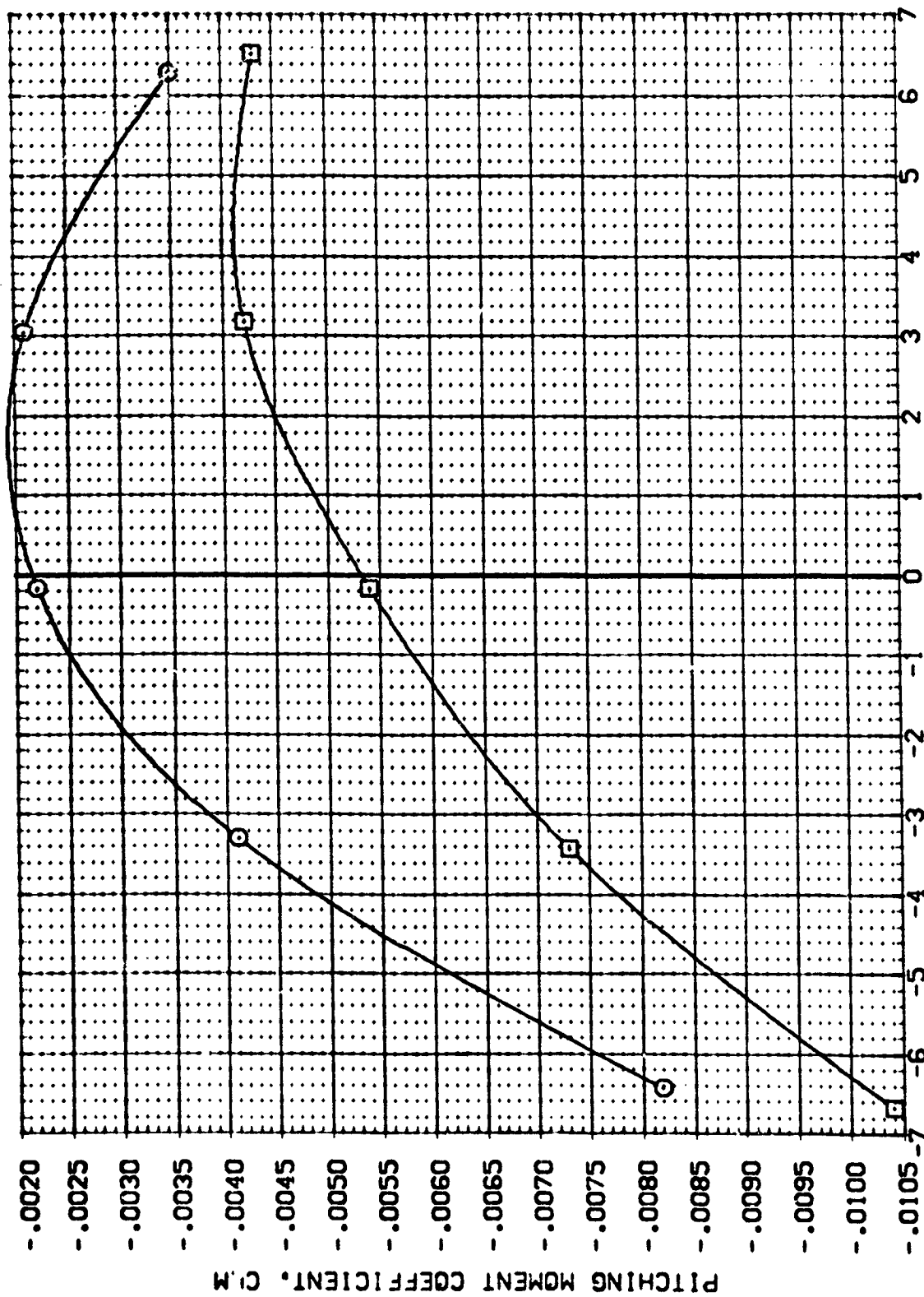


FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5, 3.5

(R80005)

AMES 87-707-CA12 02A

SYMBOL MACH PARAMETRIC VALUES
O 2.498 ALPHA .000 ELEVON .000
□ 3.501 RUDDER -20.000 R/OFLR 40.000

REFERENCE INFORMATION
SREF 2.475
LREF 39.8450
BREF 39.8450
XMRD 32.3000
YMRD .0000
ZMRD .0000
SCALE .0300

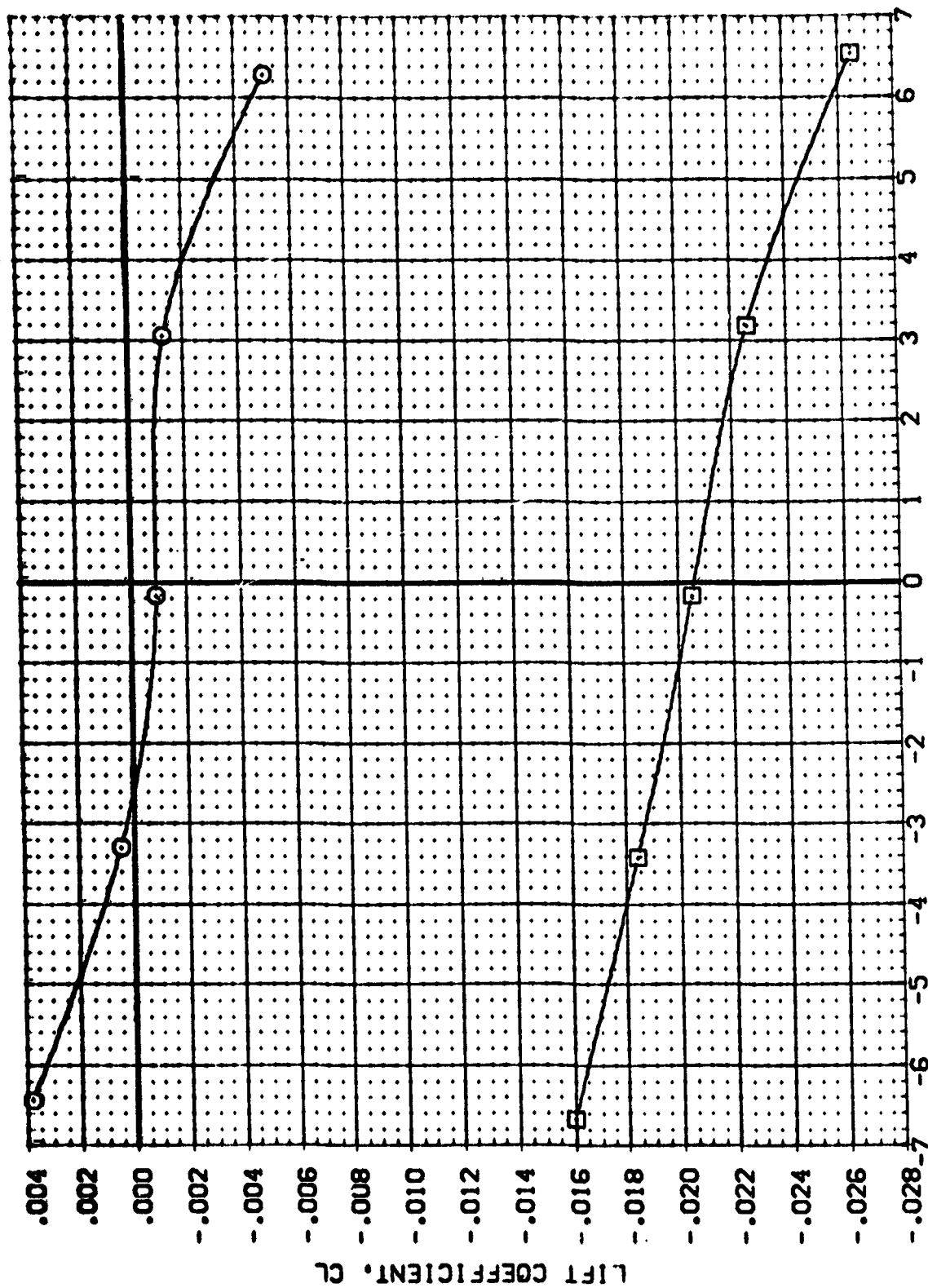


FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5,3.5

(R30005)

AVES 87-707-CA12 C2A

| SYMBOL | WICH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | SCALE |
|--------|-------|-------|---------|-------------------|--------|--------|-------|
| (1) | 2.498 | 0.00 | -20.000 | 0.000 | 40.000 | | |
| | 3.501 | | | | | | |

| REFERENCE INFORMATION | SCALE |
|-----------------------|---------|
| SREF | 2.4210 |
| AREF | 39.8490 |
| EREF | 39.8490 |
| YREF | 32.2000 |
| ZREF | 0.0000 |
| SCALE | 0.0000 |

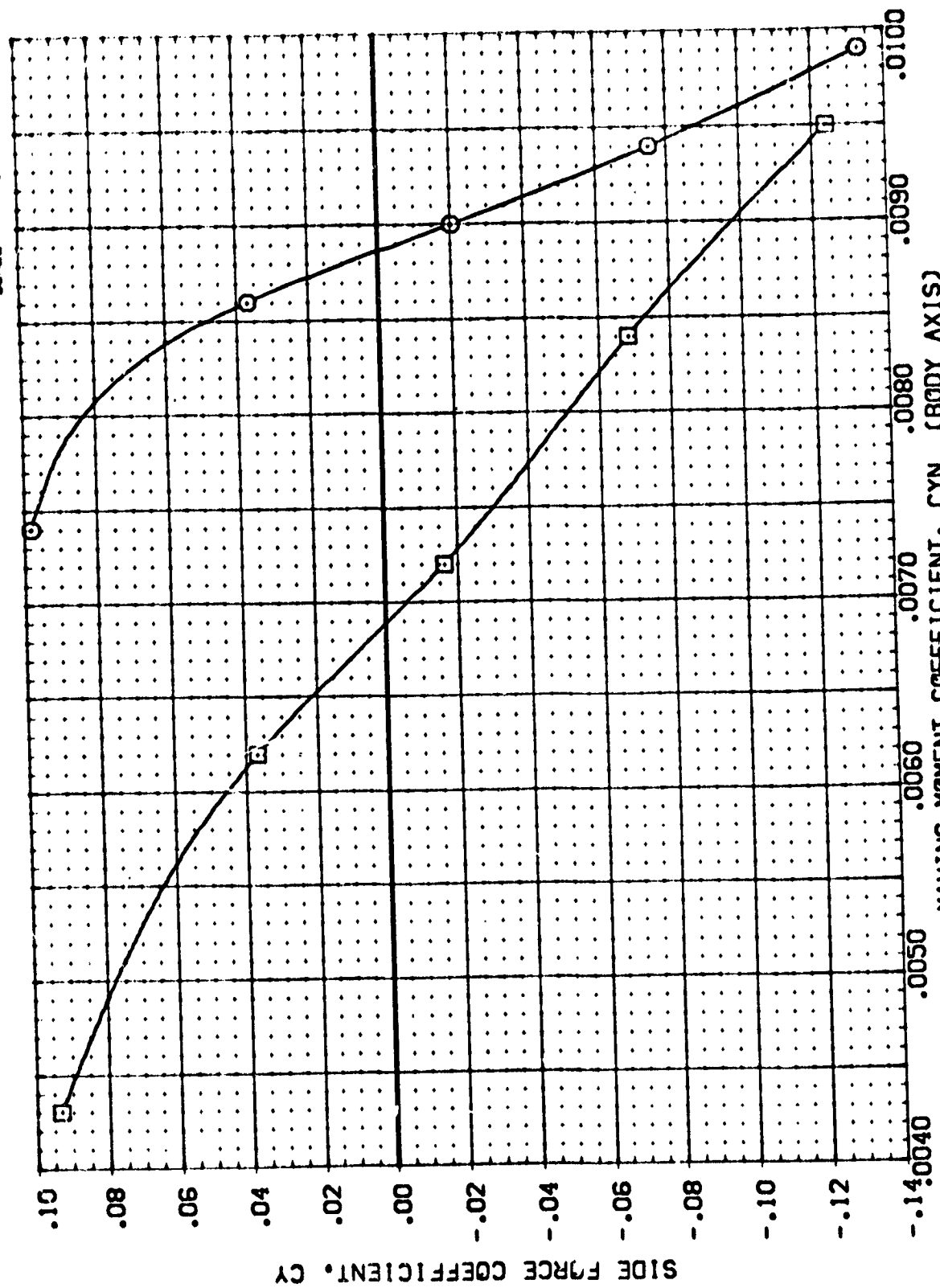


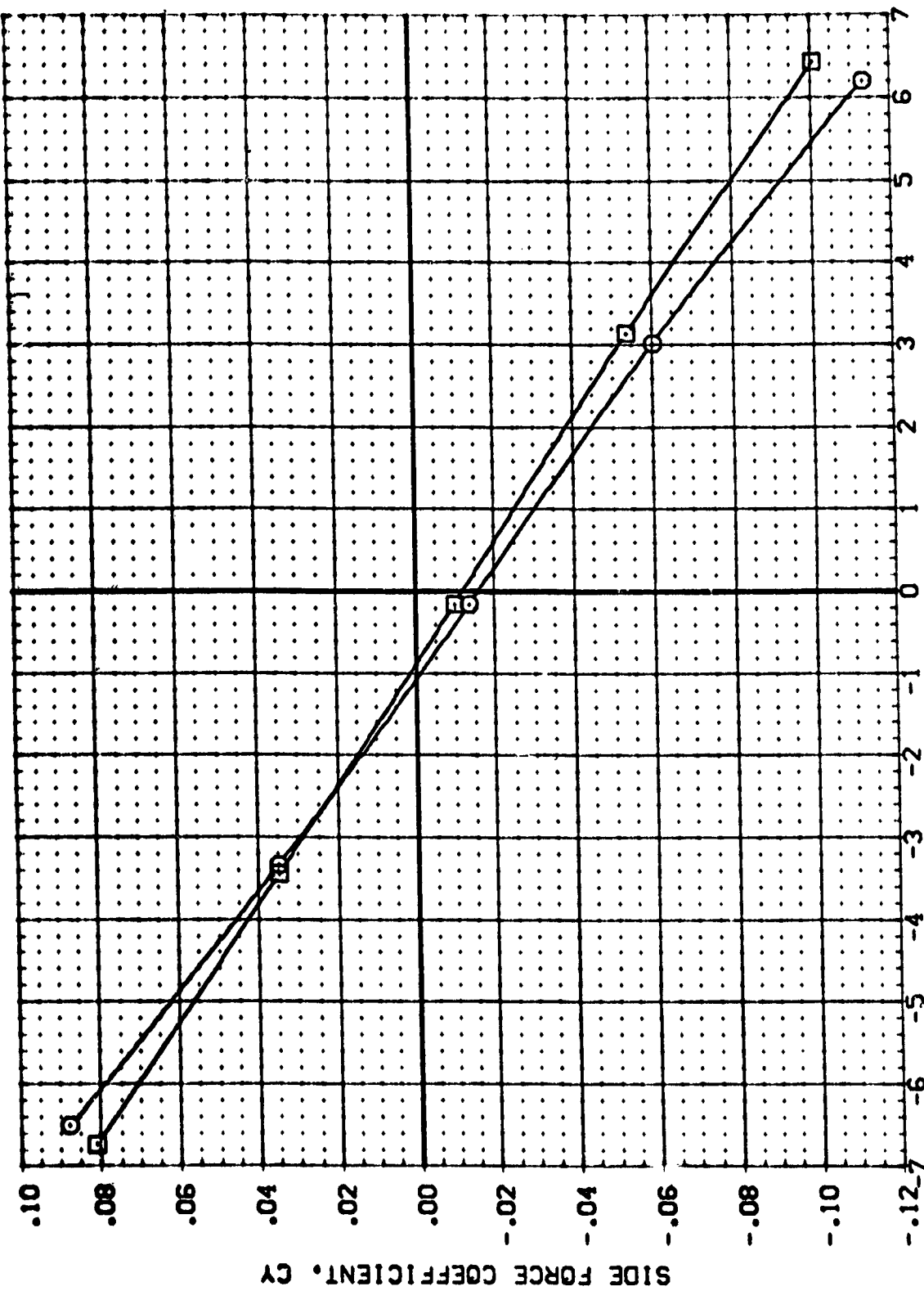
FIG.53 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=0, RUDDER=-20 DEGS., MN=2.5, 3.5

(RB00006)

AMES 87-707-CA:2 C2A

| PARAMETRIC VALUES | |
|-------------------|---------|
| WACH | 2.498 |
| ALPHA | 10.000 |
| RUDDER | -20.000 |
| ELEVON | 40.000 |
| ROFLR | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4275 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0000 |



SIDESLIP ANGLE, BETA, DEGREES

FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5,3.5

AVES 87-707-CA:2 C2A

(R8G006)

SYMBOL WACH 2.498 ALPHA 10.000 ELEVON .000
 1 3.501 RUDDER -20.000 RUDDLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XREF 32.3000
 YREF 1.0000
 ZREF 1.0000
 SCALE .0300

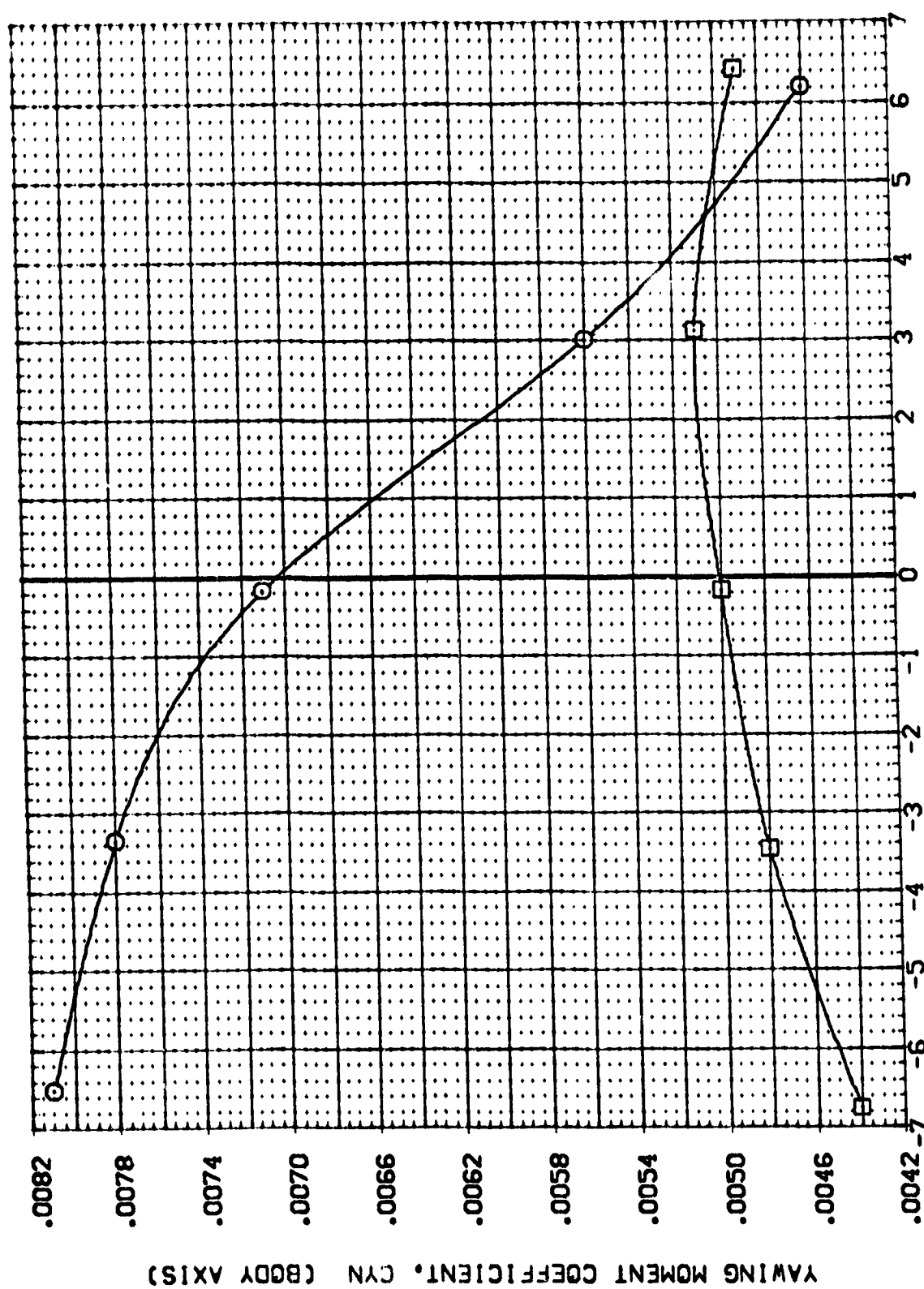


FIG. 5.4 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5, 3.5

AVES 87-707-2A:2 C2A

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|-------|---------|
| SCALE |30 |
| WIND |30 |
| XPRD |30 |
| REFE | 39.849 |
| REFI | 39.849 |
| SCALE |30 |

| | | | | | | |
|-------|--|-------|--------|-------------------|-----------|--------|
| SINGC | | WAC= | | PARAMETRIC VALUES | | |
| OL | | 2.498 | ALPHA | 10.000 | ELEVATION | .000 |
| | | 3.501 | RADIUS | -20.000 | RADIUS | 10.000 |

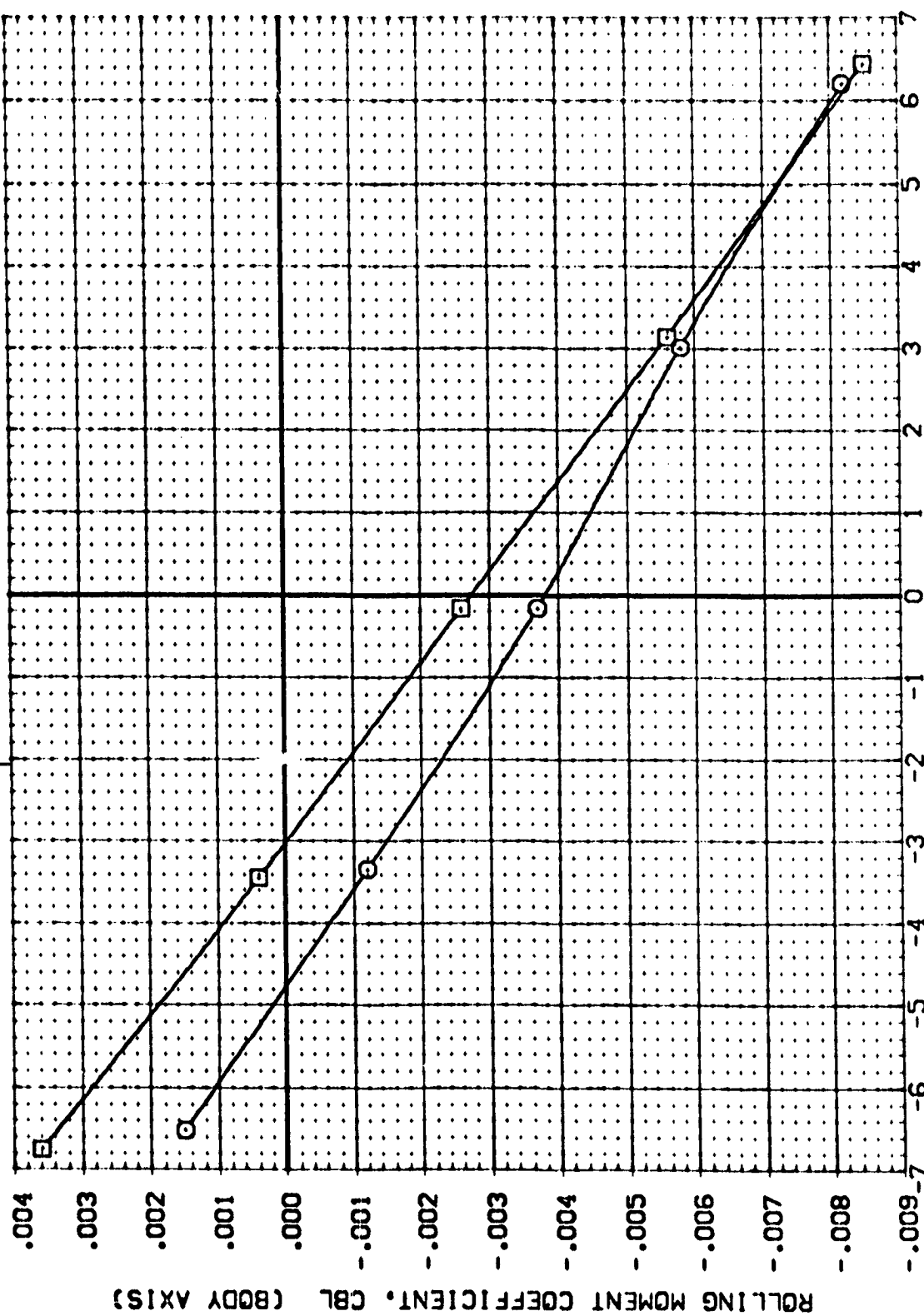


FIG. 54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5, 3.5

AVES 87-707-CA:2

| SWAGE | WASH | PARAMETRIC VALUES |
|-------|-------|-------------------|
| () | 2.498 | A-D-A |
| | 3.501 | POWER |
| | | 10.000 |
| | | 20.000 |
| | | 30.000 |
| | | 40.000 |
| | | 50.000 |
| | | 60.000 |
| | | 70.000 |
| | | 80.000 |
| | | 90.000 |
| | | 100.000 |

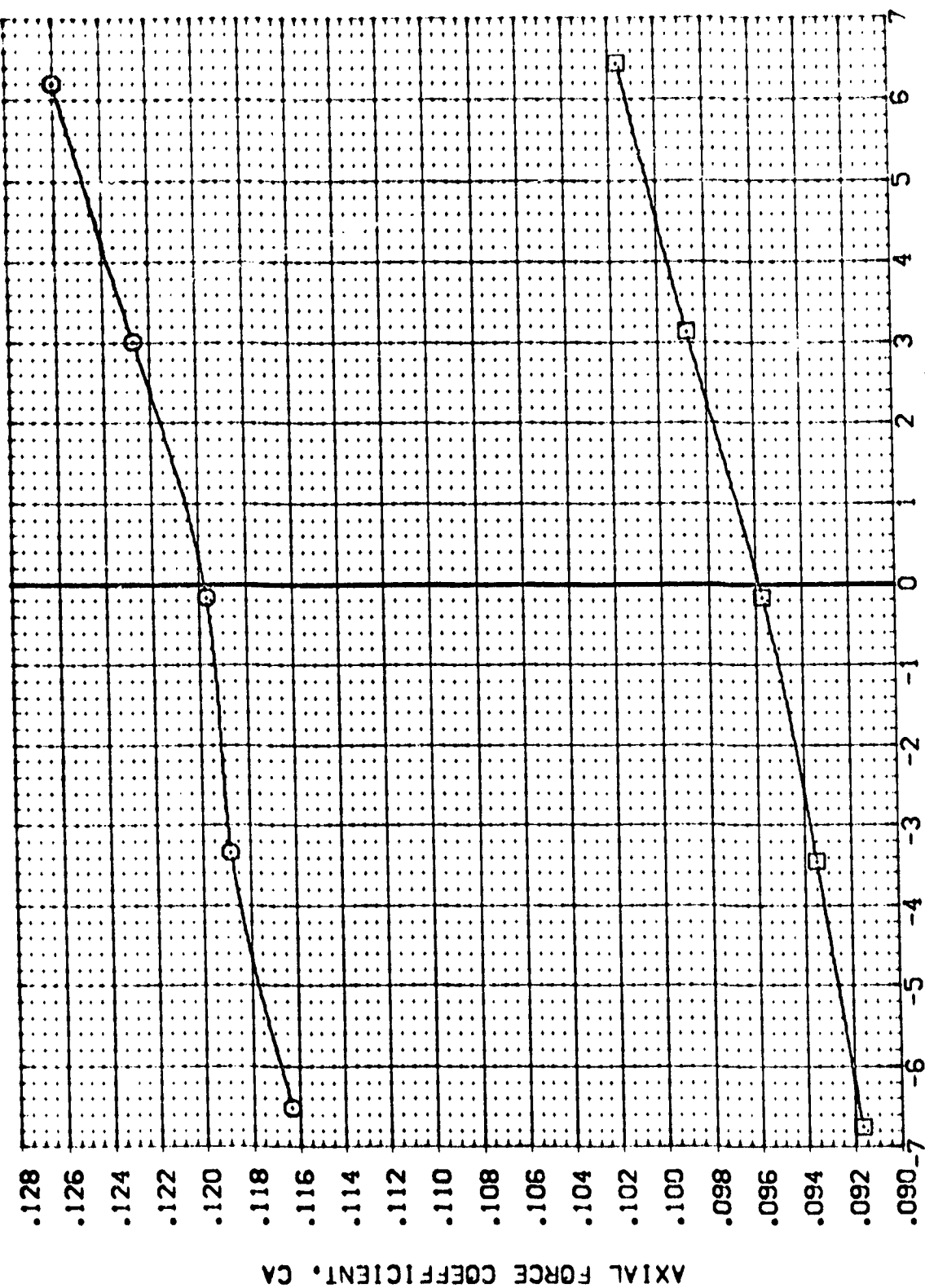
[illegible]

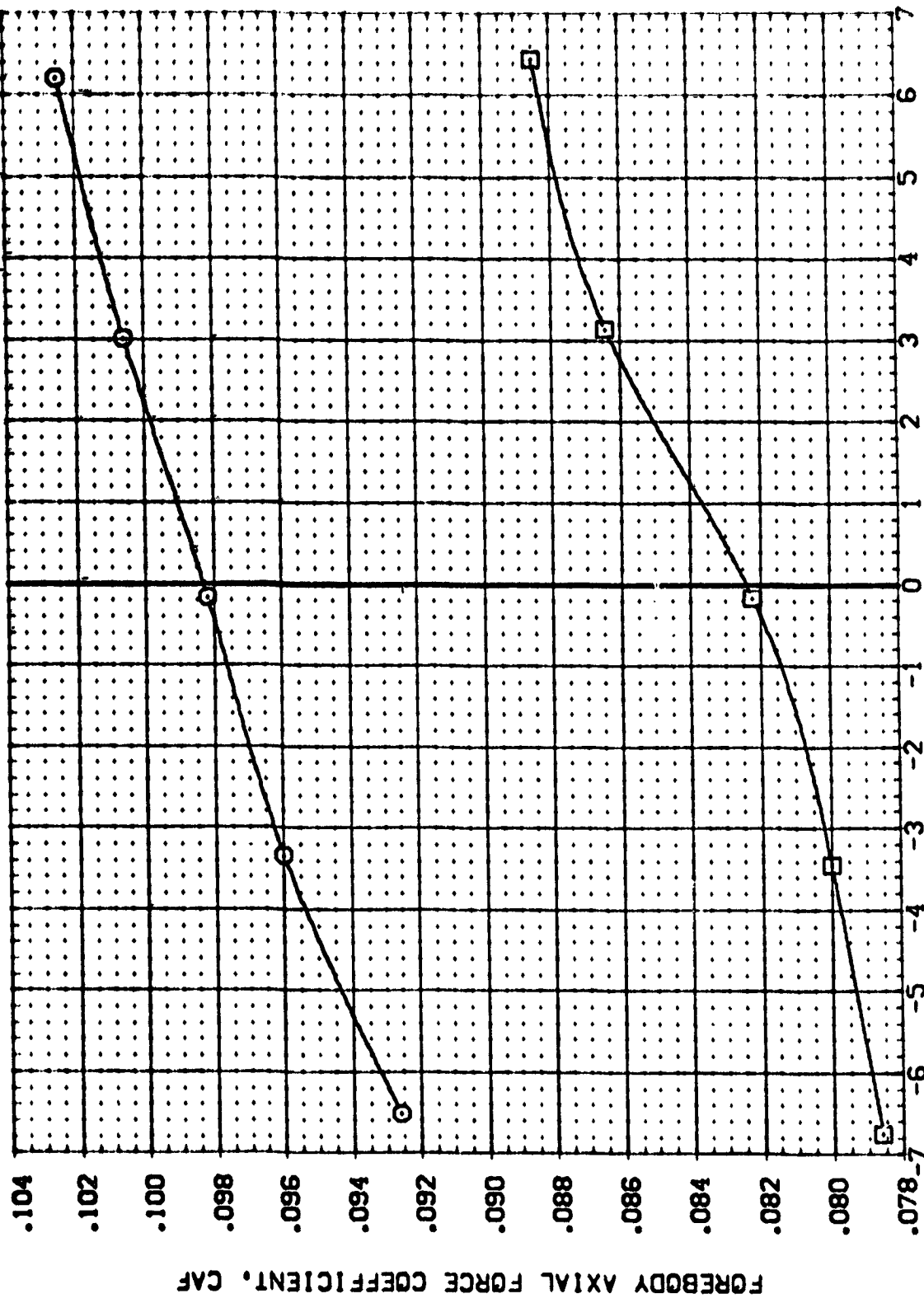
FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5,3.5

AVES 87-707-CA12 02A

(R80006)

SYMBOL WAC-
 2.498 ALPHA
 3.500 RUDDER
 10.000 ELEVON
 -20.000 RUDDER
 .000
 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 38.8490
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5,3.5

(R80006)

AVES 87-707-0A12 02A

| SYMBOL | WAC | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | SCALE |
|--------|-------|--------|---------|-------------------|--------|--------|-------|
| 170 | 2.498 | 10.000 | -20.000 | .000 | 40.000 | | |

REFERENCE INFORMATION:
SREF 2.4210
REF 39.8490
SREF 39.8490
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 1.000

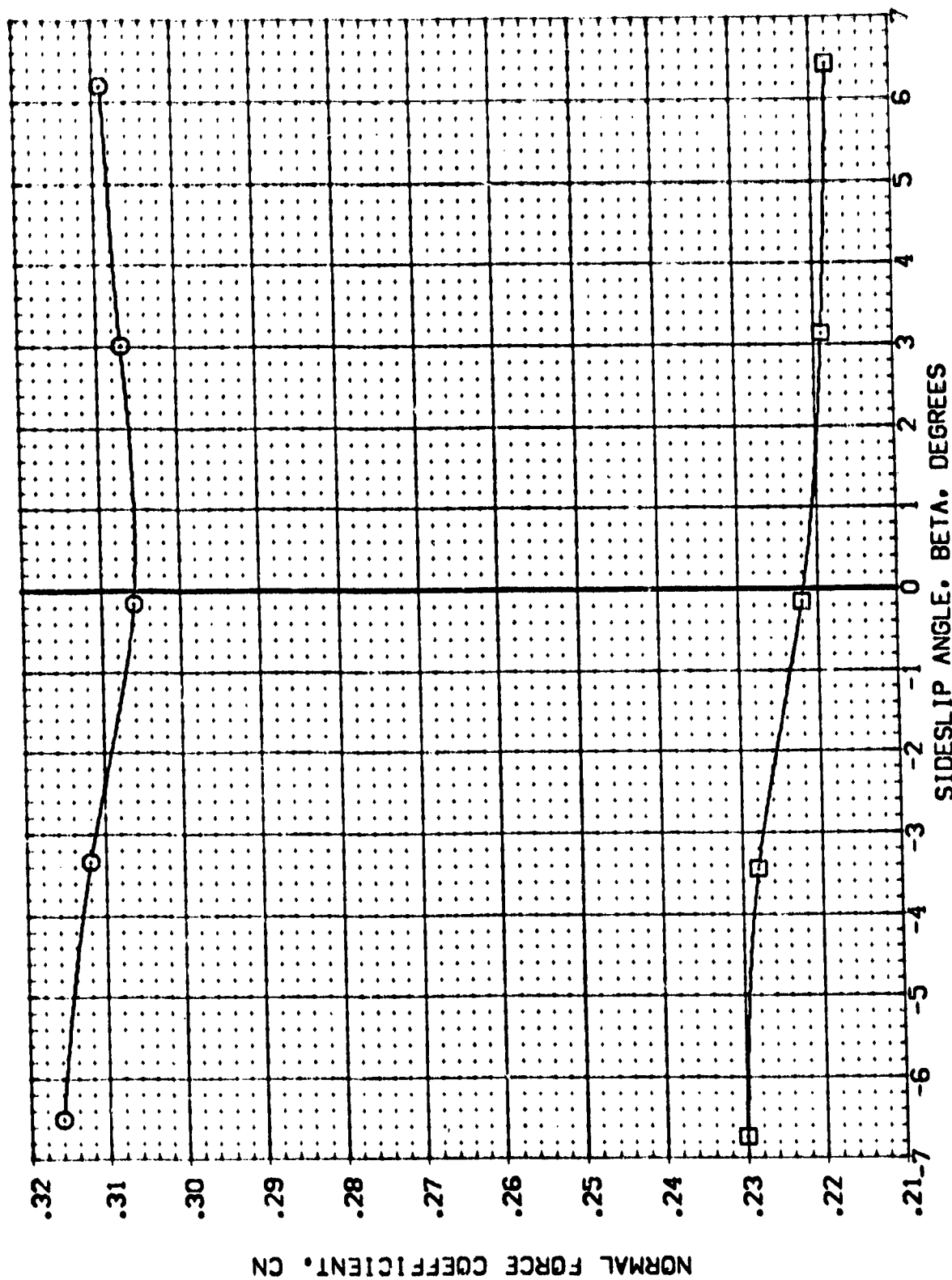


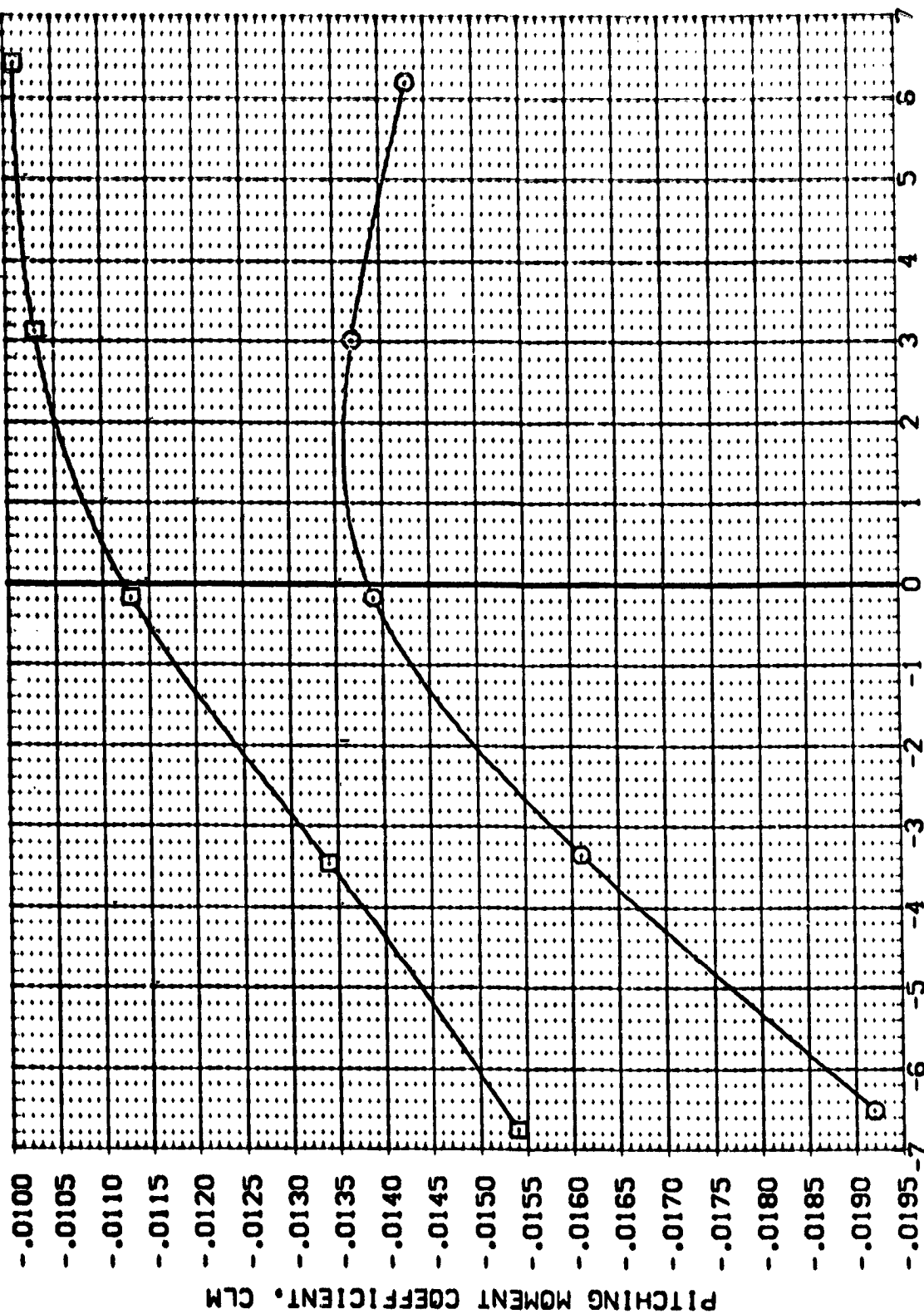
FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5, 3.5

AMES 87-707-CA:2 C2A

(R93006)

SYMBOL MACH PARAMETRIC VALUES
 □ 2.498 ALPHA 10.000 ELEVON .000
 3.501 RUDDER -20.000 RUOFLR 40.000

REFERENCE INFORMATION
 SREF 2.4212
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 1.0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=10. RUDDER=-20 DEGS. MN=2.5, 3.5

[R80006]

AMES 87-707-CA12 C2A

SYMBOL 11001
 MAC 2.498
 3.501
 PARAMETRIC VALUES
 ALPHA 10.000
 RUDER -20.000
 ELEVON 40.000
 ROLLOP .000

REFERENCE INFORMATION
 SREF 2.4210
 REF 38.8490
 BREF 38.8490
 XREF 37.3000
 YREF 37.3000
 ZREF 37.3000
 SCALE 1.0000

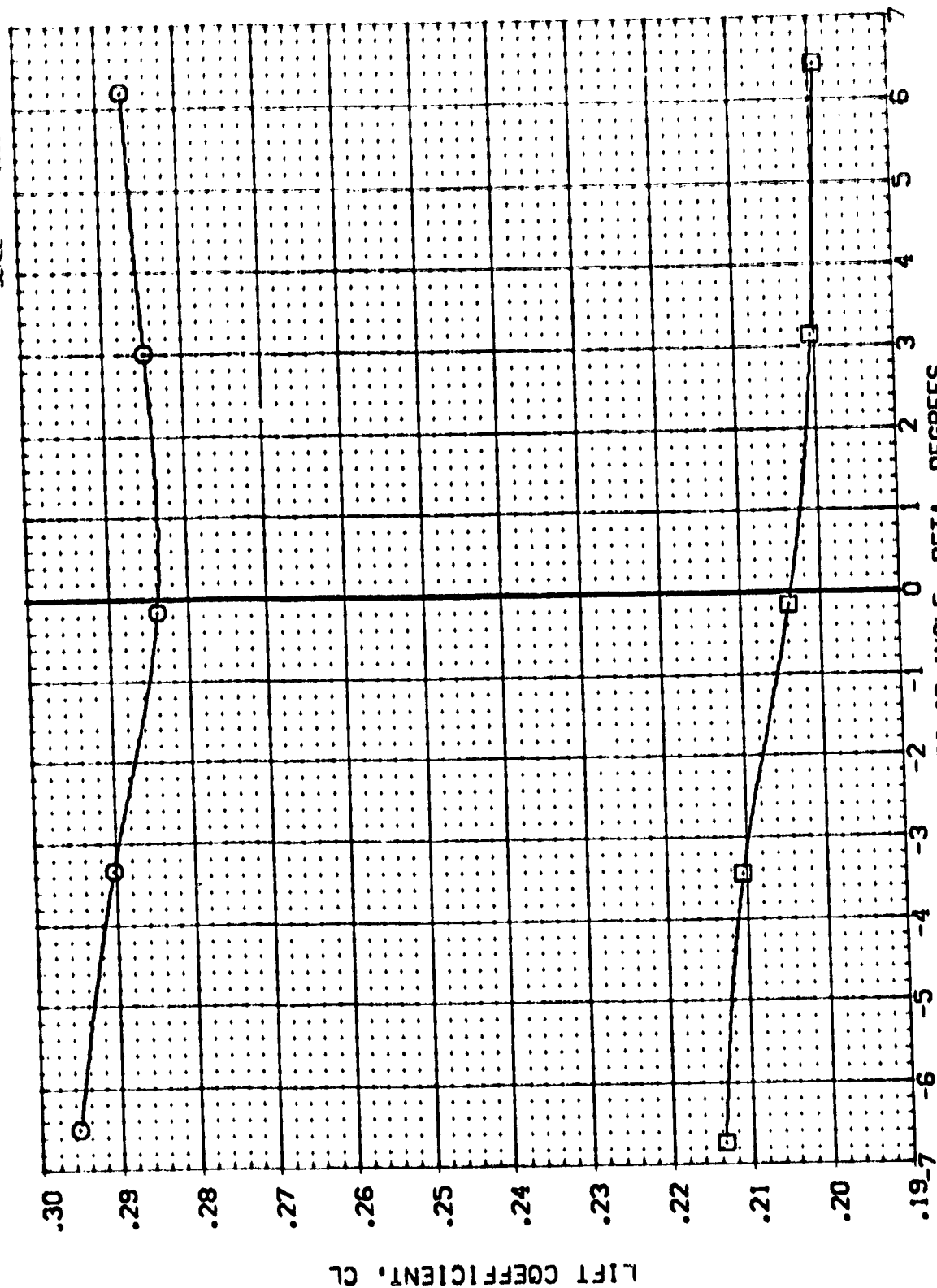


FIG.54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5, 3.5
 PAGE 454

(R32006)

| SYMBOL | WACC | ALPHA | RISK | PARAMETRIC VALUES |
|--------|-------|---------|-----------------|-------------------|
| OL | 2.498 | 10.000 | R _{OL} | .000 |
| | 3.521 | -20.000 | R _{OL} | 40.000 |

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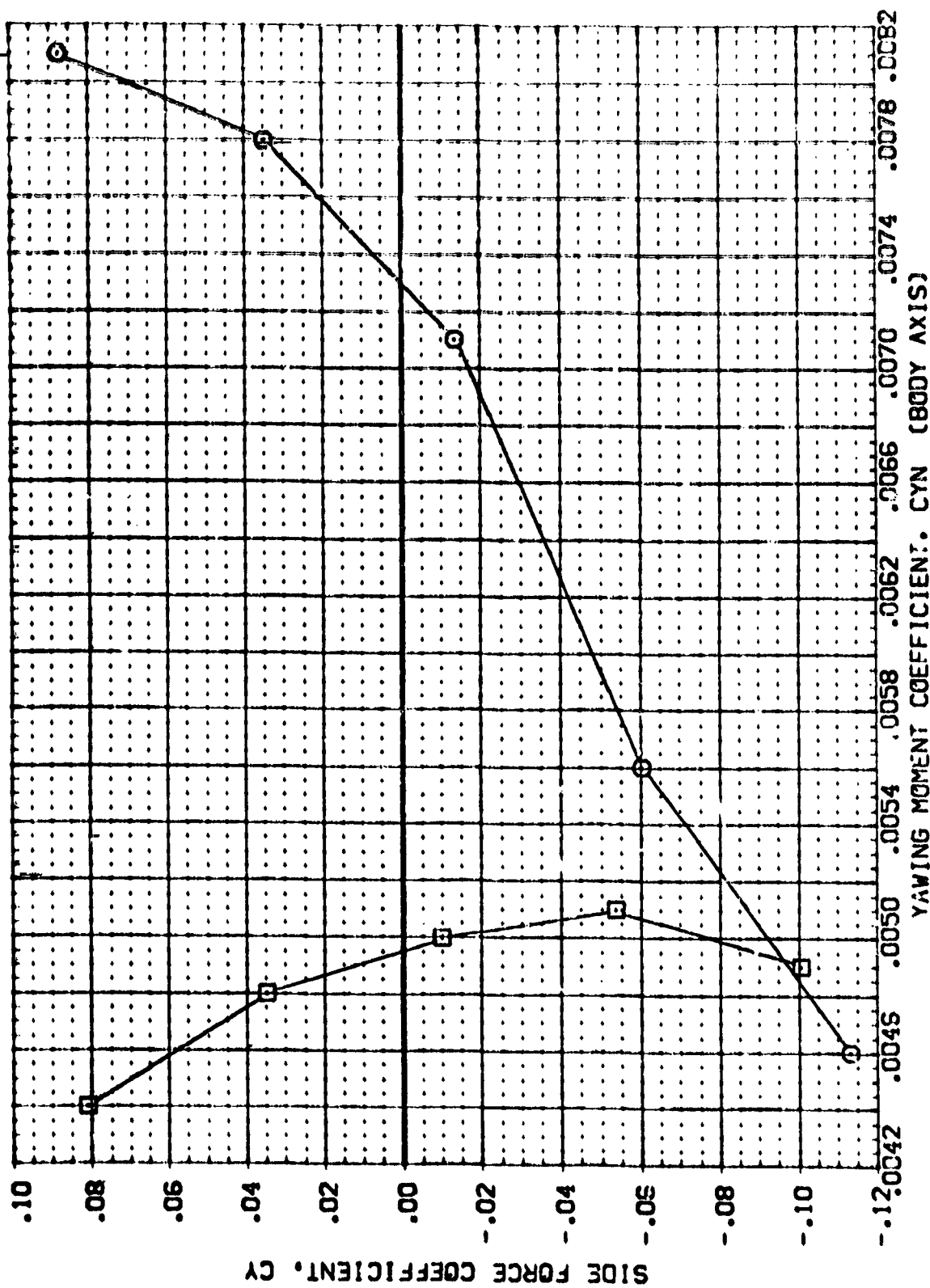


FIG. 54 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=10, RUDDER=-20 DEGS., MN=2.5, 3.5

A/S 87-707-CA:2

[illegible]

| PARAMETRIC VALUES | MACRO |
|-------------------|--------|
| ELEVATION | 2.499 |
| POWER | 3.500 |
| ROSE | 40.000 |

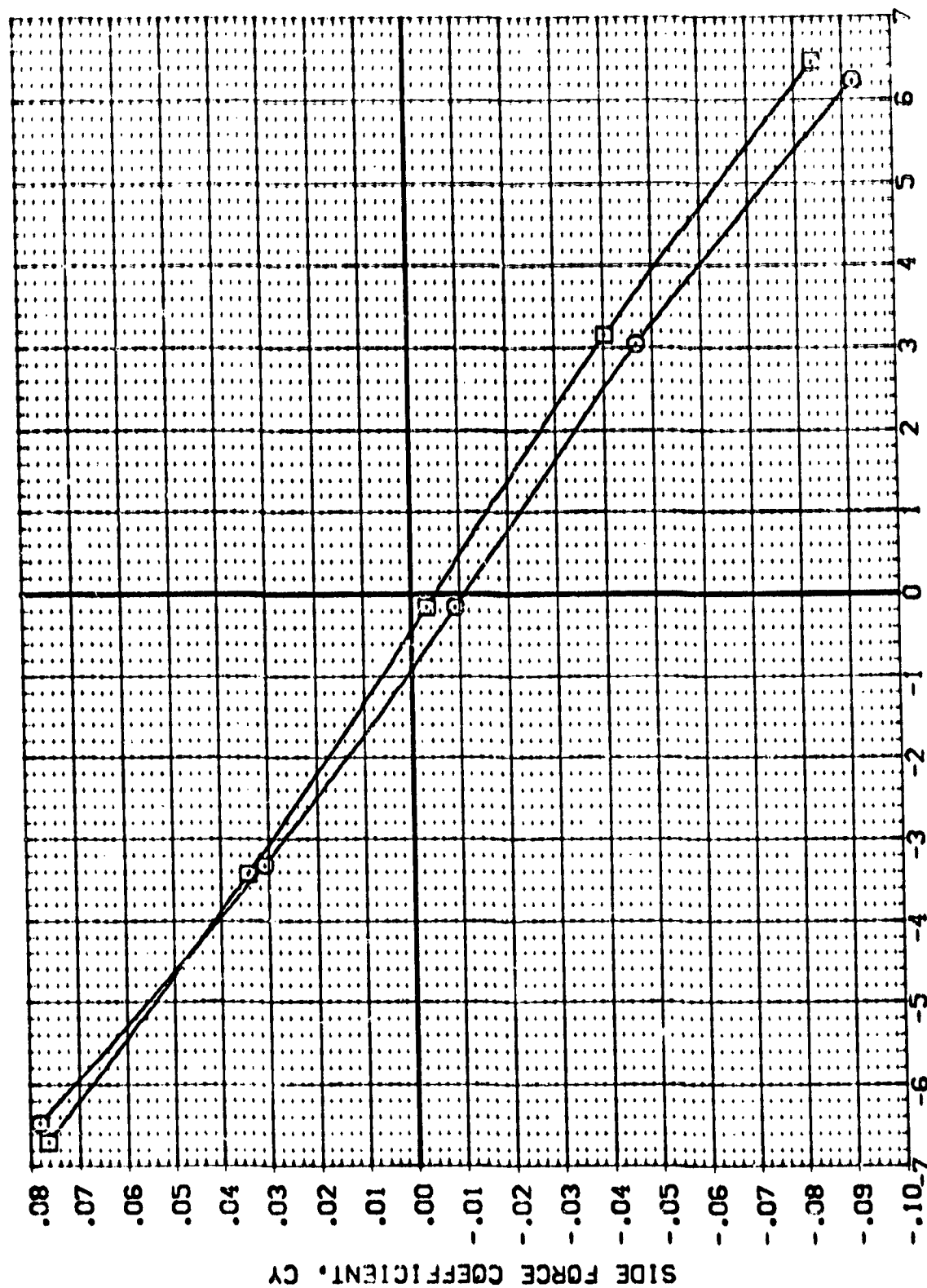


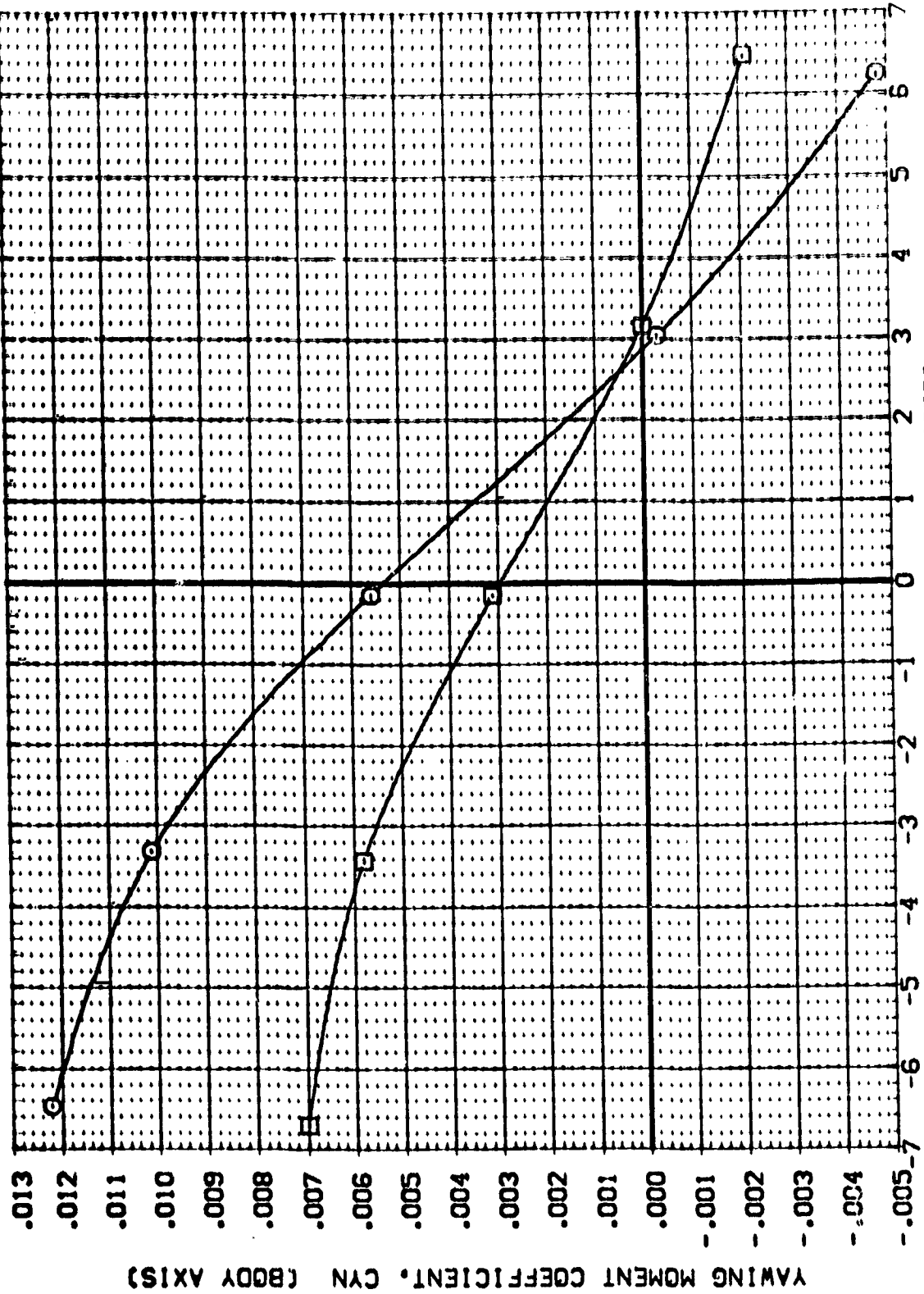
FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., VN=2.5,3.5

(R333007)

AVES 87-707-CA12 C2A

SYNO. 2.498 ALPHA 20.000 ELEVON .000
3.500 RUDDER -20.000 RUDDER 40.000

REFERENCE IN SPAN: 2.42
SPAN 39.816
REF 39.816
SPAN 39.816
X400 30.300
Y400 100.000
Z400 100.000
SCALE 1:300



SIDESLIP ANGLE, BETA, DEGREES

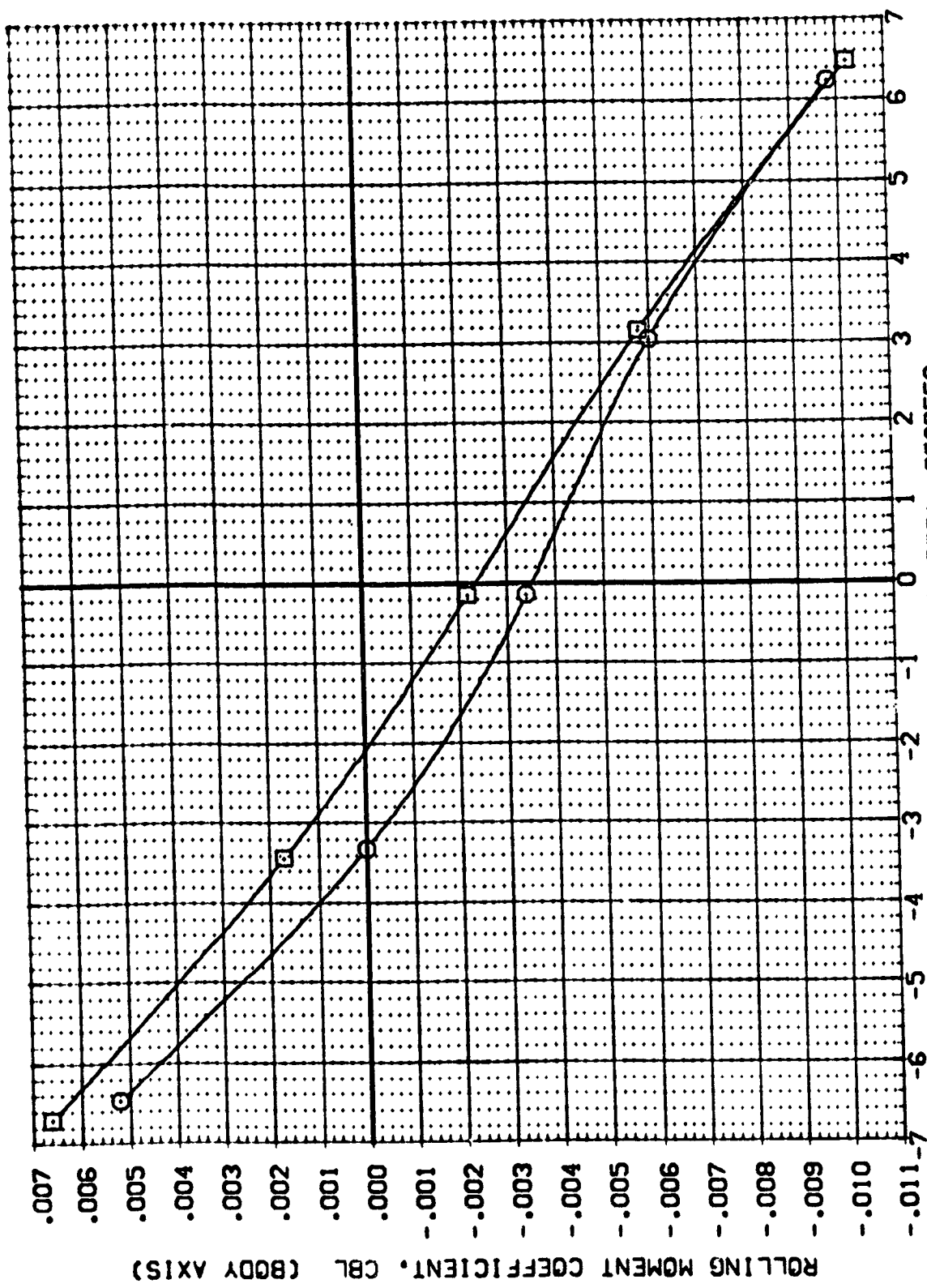
FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5, 3.5

(R80007)

AMES 87-707-CA:2 02A

WACH 2.458 ALPHA 20.000 ELEVON .000
3.50: RUDDER -20.000 RUDFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 38.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

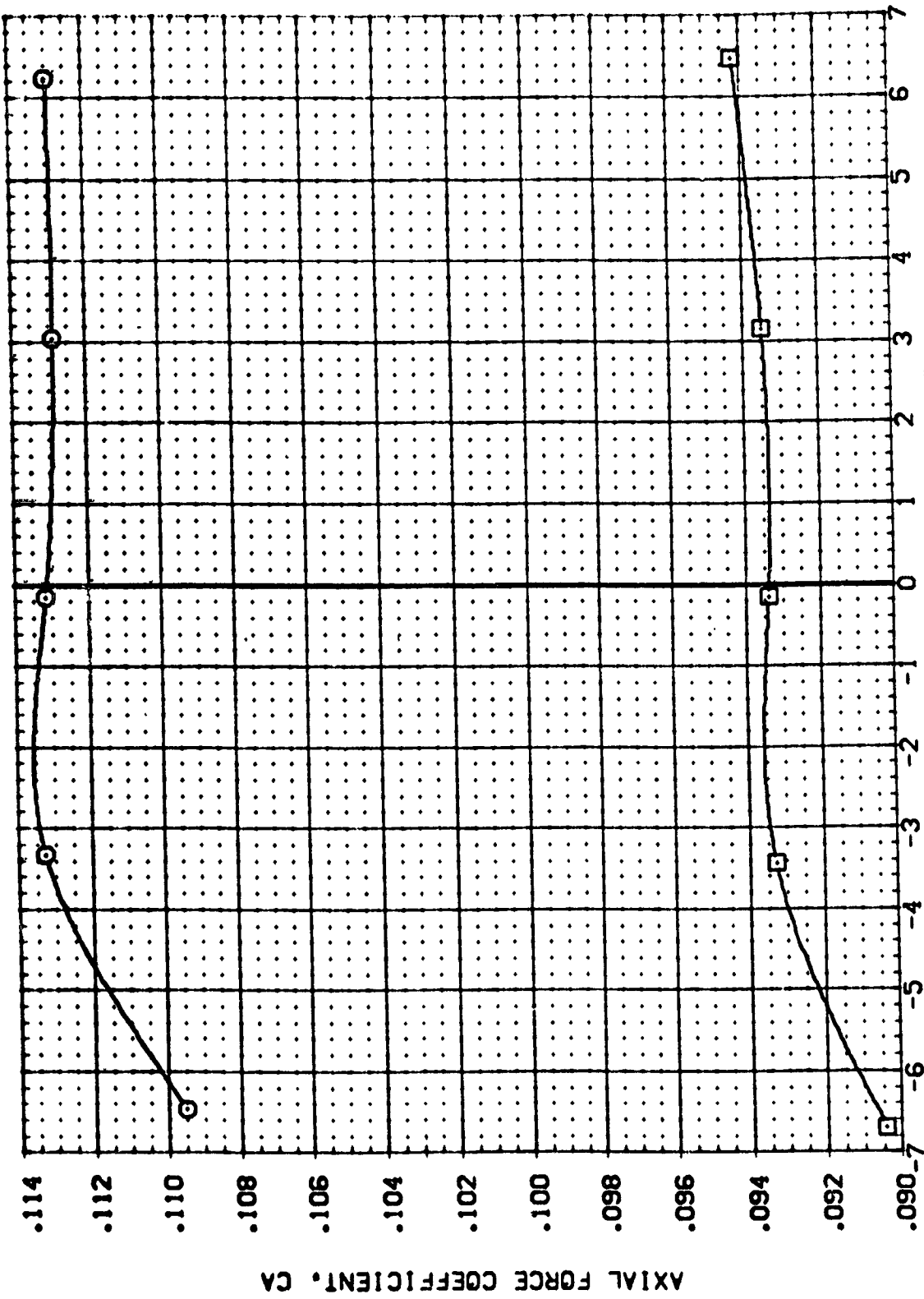
FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA. ALPHA=20, RUDDER=-20 DEGS., MN=2.5,3.5

AMES 87-707-0A12 02A

(RB0007)

SYMBOL MACH ALPHA RUDDER
 O 2.498 20.000 20.000
 □ 3.501 -20.000 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE 0.300



SIDESLIP ANGLE, BETA, DEGREES

FIG.55 ORBITER LAT-CIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5, 3.5

(R80007)

AVES 87-707-CA12 C2A

| SYMBOL | WACH | PARAMETRIC VALUES | | |
|--------|-------|-------------------|--------|--------|
| | | ALPHA | ELEVON | RUDDER |
| NO | 2.498 | 20.000 | 40.000 | |
| | 3.501 | -20.000 | 40.000 | |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRP | 32.3000 |
| YPRP | 0.0000 |
| ZPRP | 0.0000 |
| SCALE | 0.0000 |

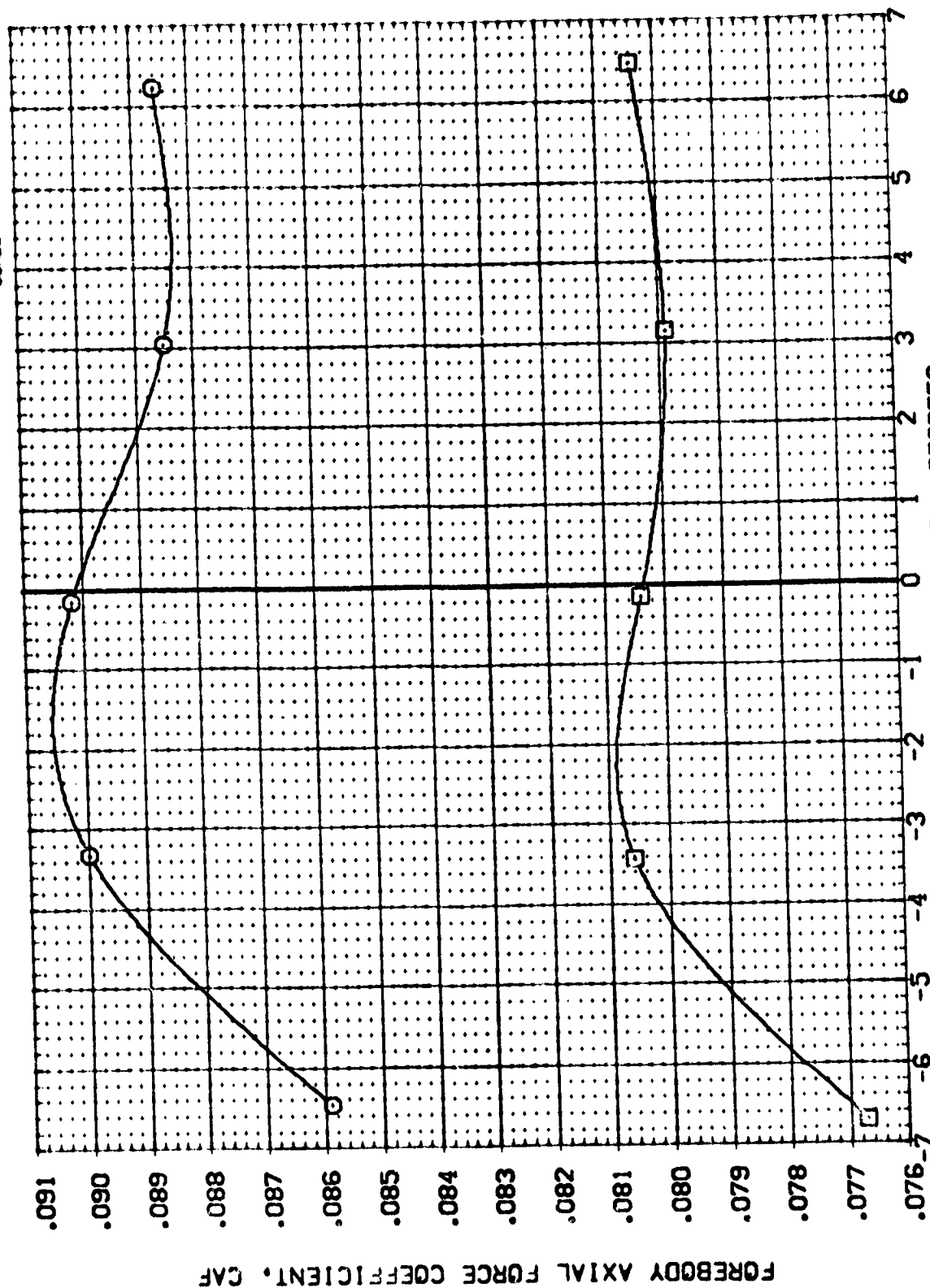


FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5,3.5

(RB00007)

AMES 87-707-CA12 C2A

SYMBOL MACH ALPHA RUDDER
2.498 20.000 ELEVEN 40.000
3.501 20.000 RUDDLR

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8490
BREF 39.8490
XPRP 32.3000
YPRP 10.0000
ZPRP 0.0000
SCALE 1.0000

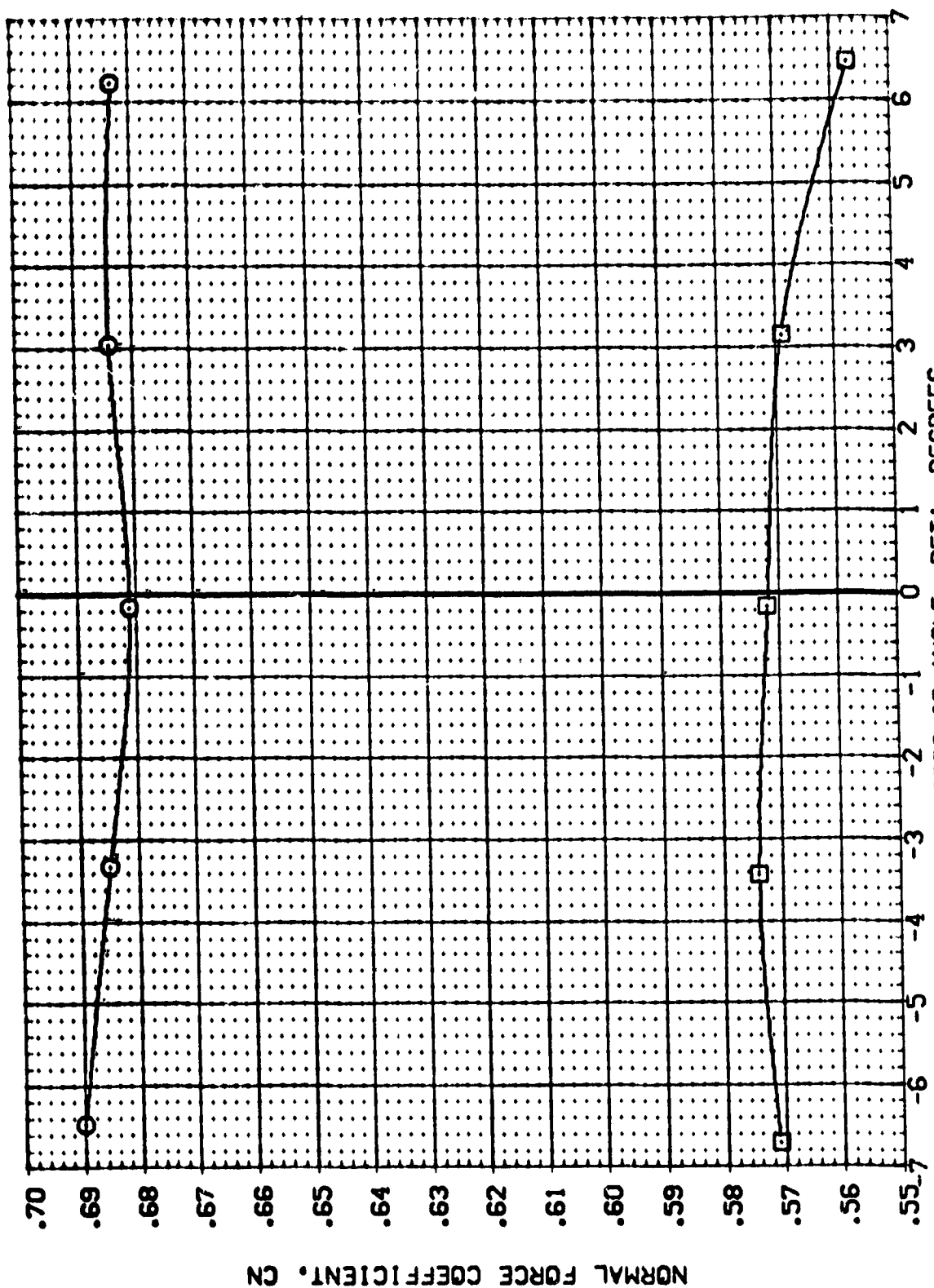


FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5,3.5

(R8G007)

AVES 87-707-GA12 02A

SYMBOL MACH 2.498 ALPHA 20.000 ELEVON .000
NO 3.500 RUDDER -20.000 RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
YPRP 32.3000
ZPRP 10.0000
SCALE 10000
SCALE 1000

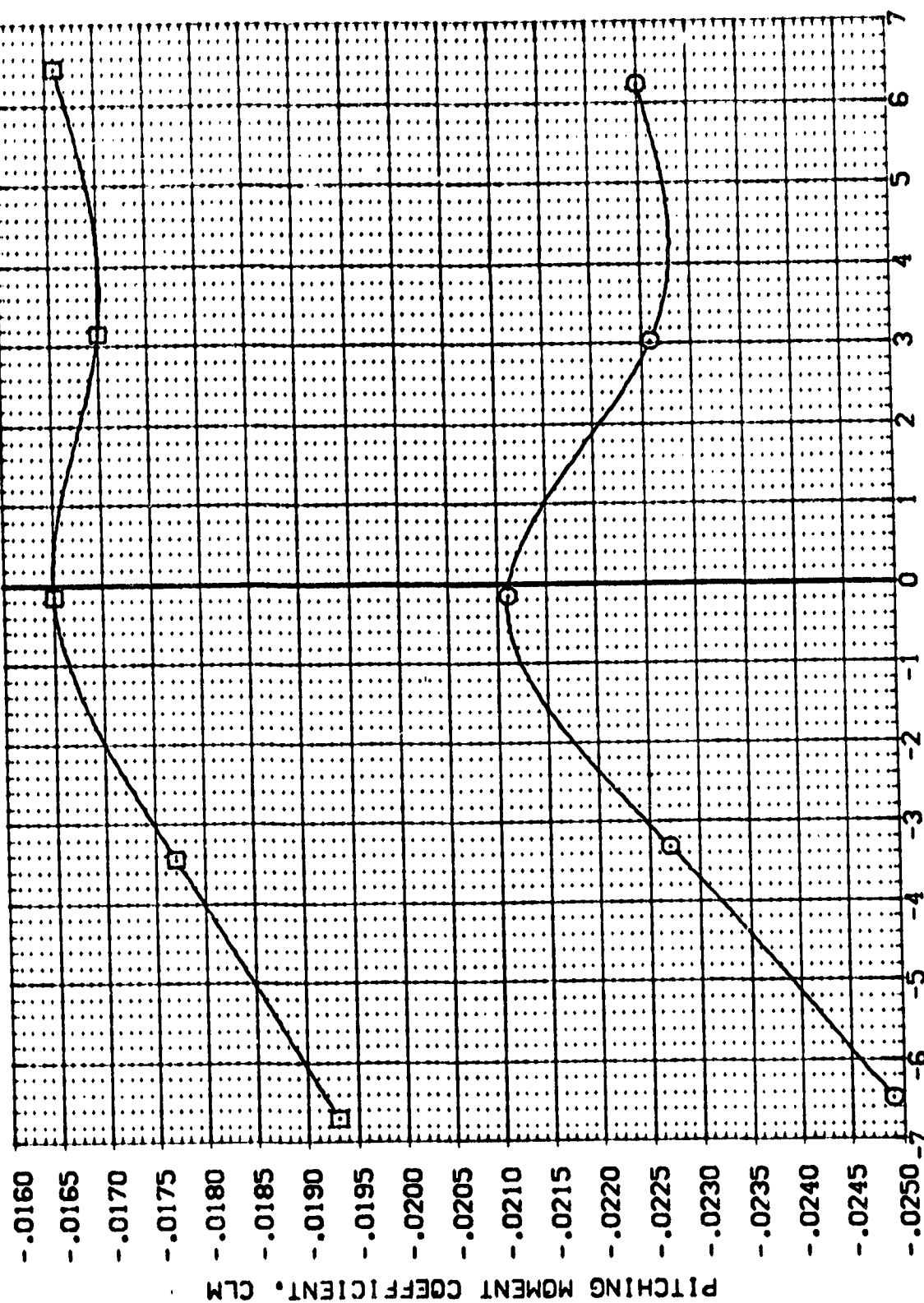


FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5, 3.5

III

(R300007)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 2.498 20.000 ELEVON .000
 3.500 -20.000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.421C
 LREF 39.849C
 BREF 39.849C
 XREF 32.300C
 YREF 10.000C
 ZREF 10.000C
 SCALE 10.000

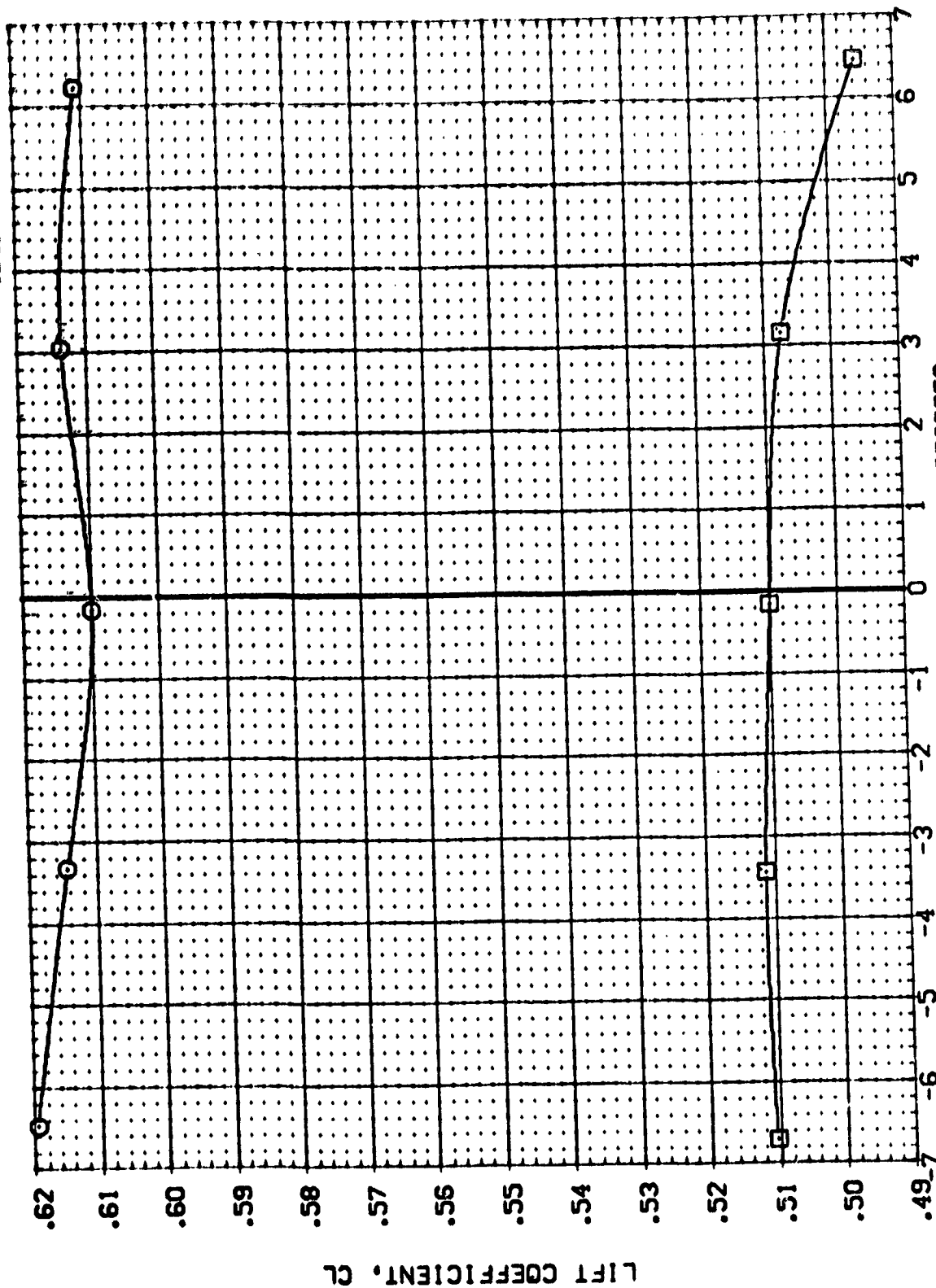


FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5, 3.5
 PAGE 463

(RBG007)

AVES 87-707-GA12 02A

SYMBOL VAC-1
2.498
3.501
PARAMETRIC VALUES
ALPHA 20.000
ELEVON 40.000
RUDDER -20.000
RJOFLR .000

REFERENCE INFORMATION
SREF 2.498
LREF 39.815C
BREF 39.815C
XREF 32.300
YREF .000
ZREF .000
SCALE .000

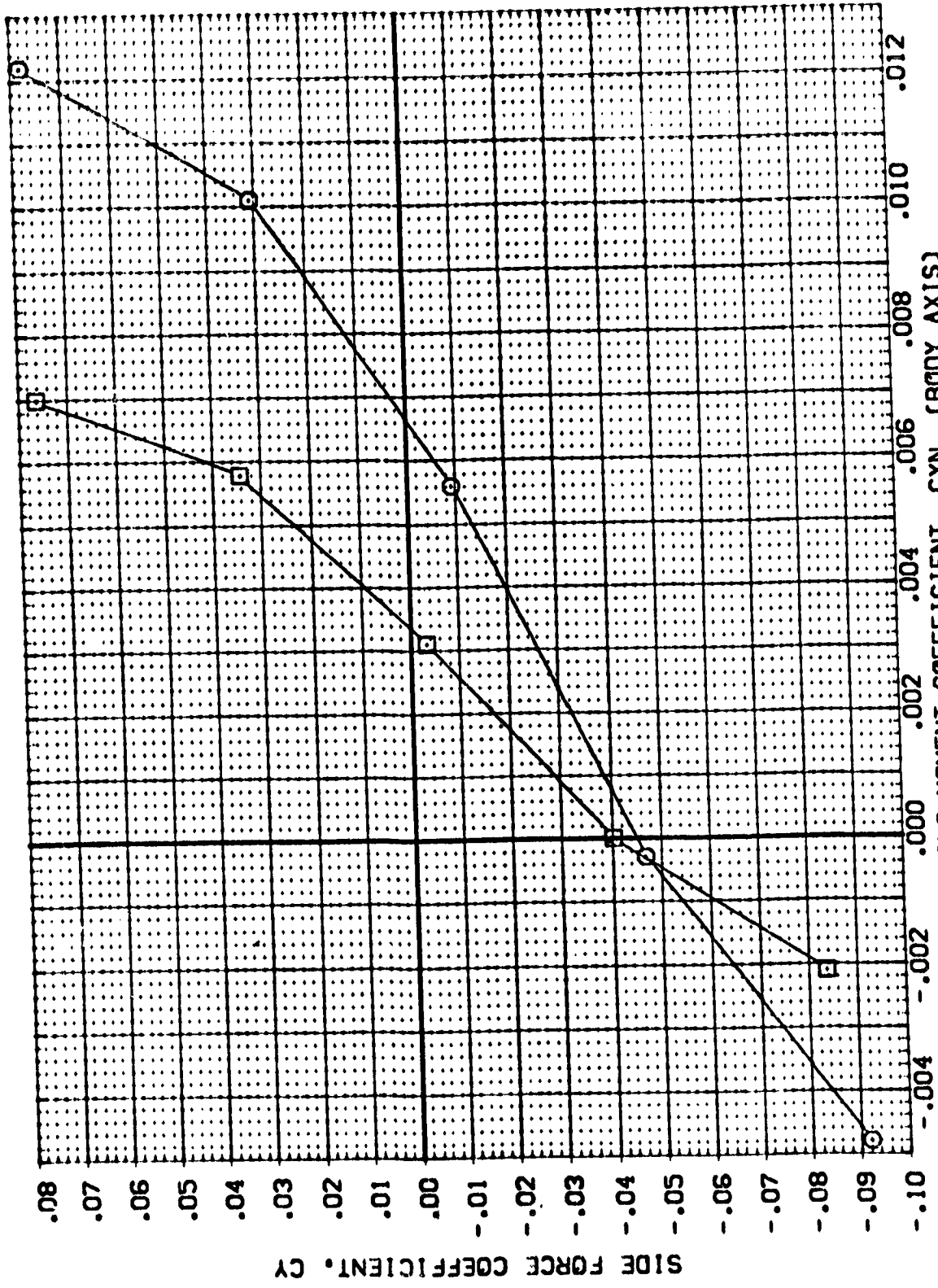


FIG.55 ORBITER LAT-DIR. AERODYNAMIC DATA, ALPHA=20, RUDDER=-20 DEGS., MN=2.5, 3.5

AVES 87-707-GA12 C2A

(R80008)

SYMBOL WACH MAGN ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 32.3000
 ZREF 32.3000
 SCALE 1:300

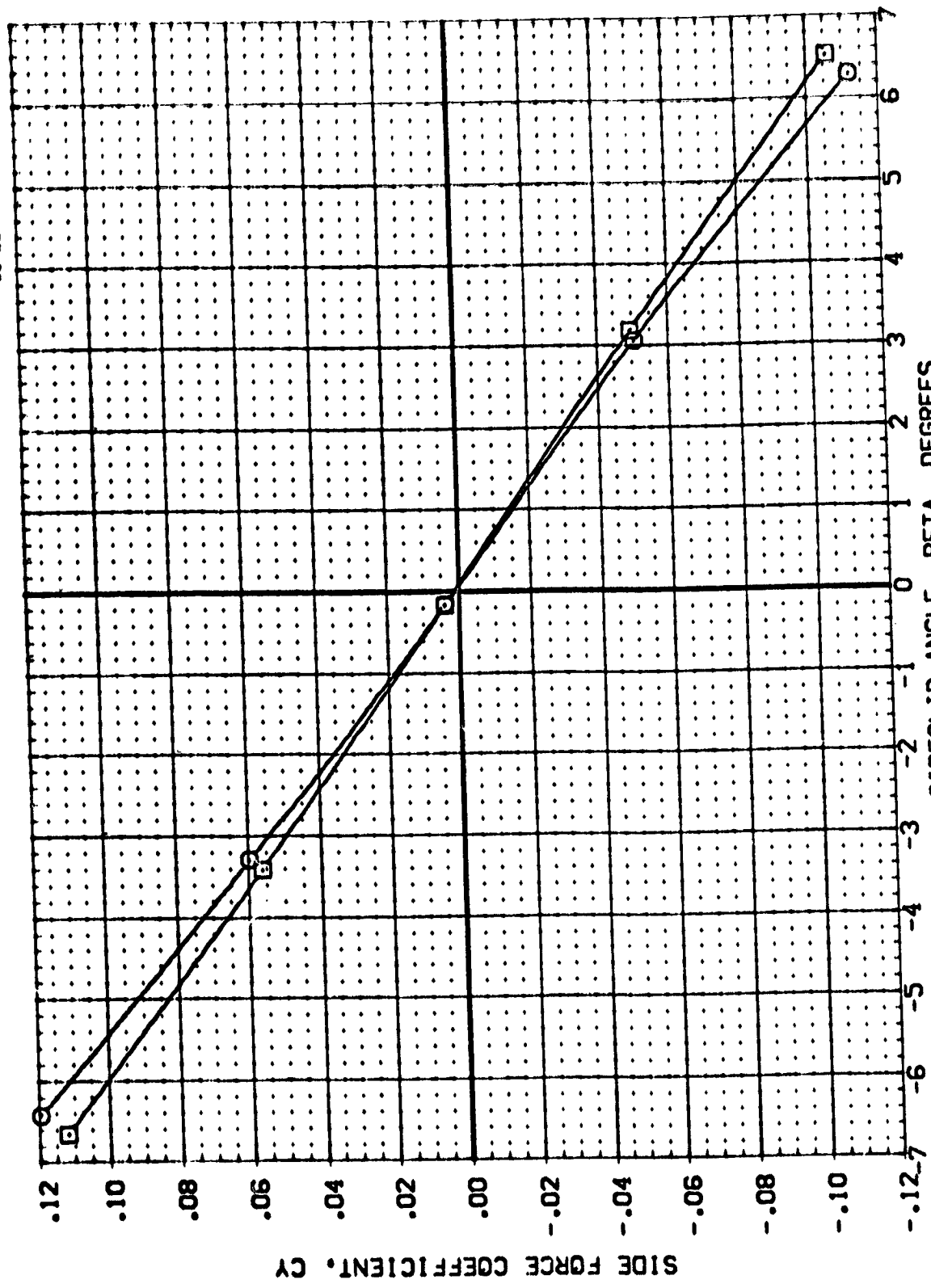


FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 465

(R8G008)

AMES 87-707-CA:2 02A

| SYMBOL | WING | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | 10.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|--------|--------|
| () | 2.498 | .000 | .000 | RJDFLR | | | |
| () | 3.501 | .000 | .000 | RJDFLR | | | |

| REFERENCE INFORMATION | SCALE |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| YREF | 37.0000 |
| ZREF | 0.0000 |
| SCALE | 0.0000 |

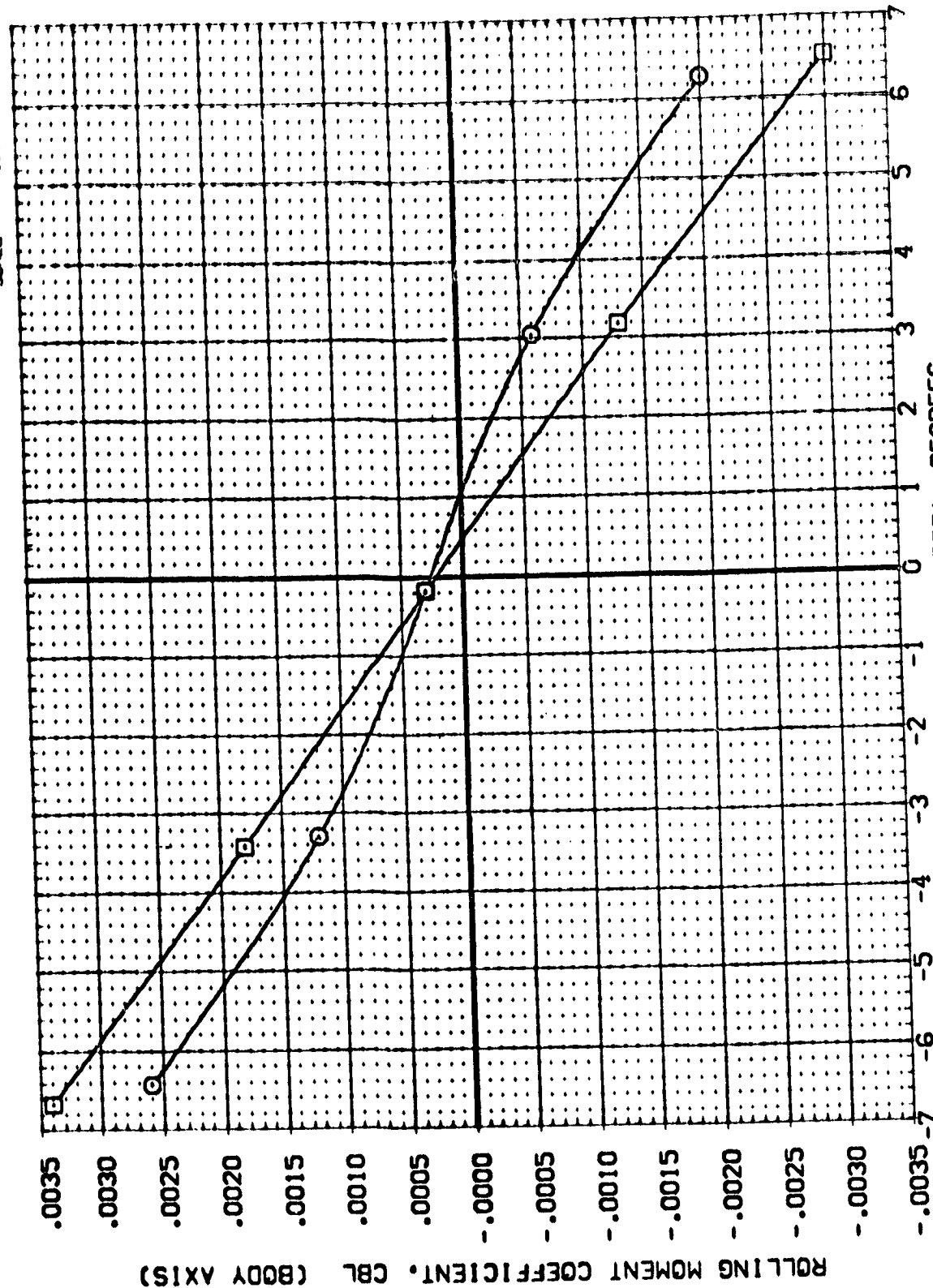


FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R83008)

AVES 87-707-3A:2 02A

SYMBOL WACH
2.498
3.501
PARAMETRIC VALUES
ALPHA .000
ELEVON 10.000
RUDDER .000
RUFLR 10.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRD 30
YPRD 3000
ZPRD 3000
SCALE 1:300

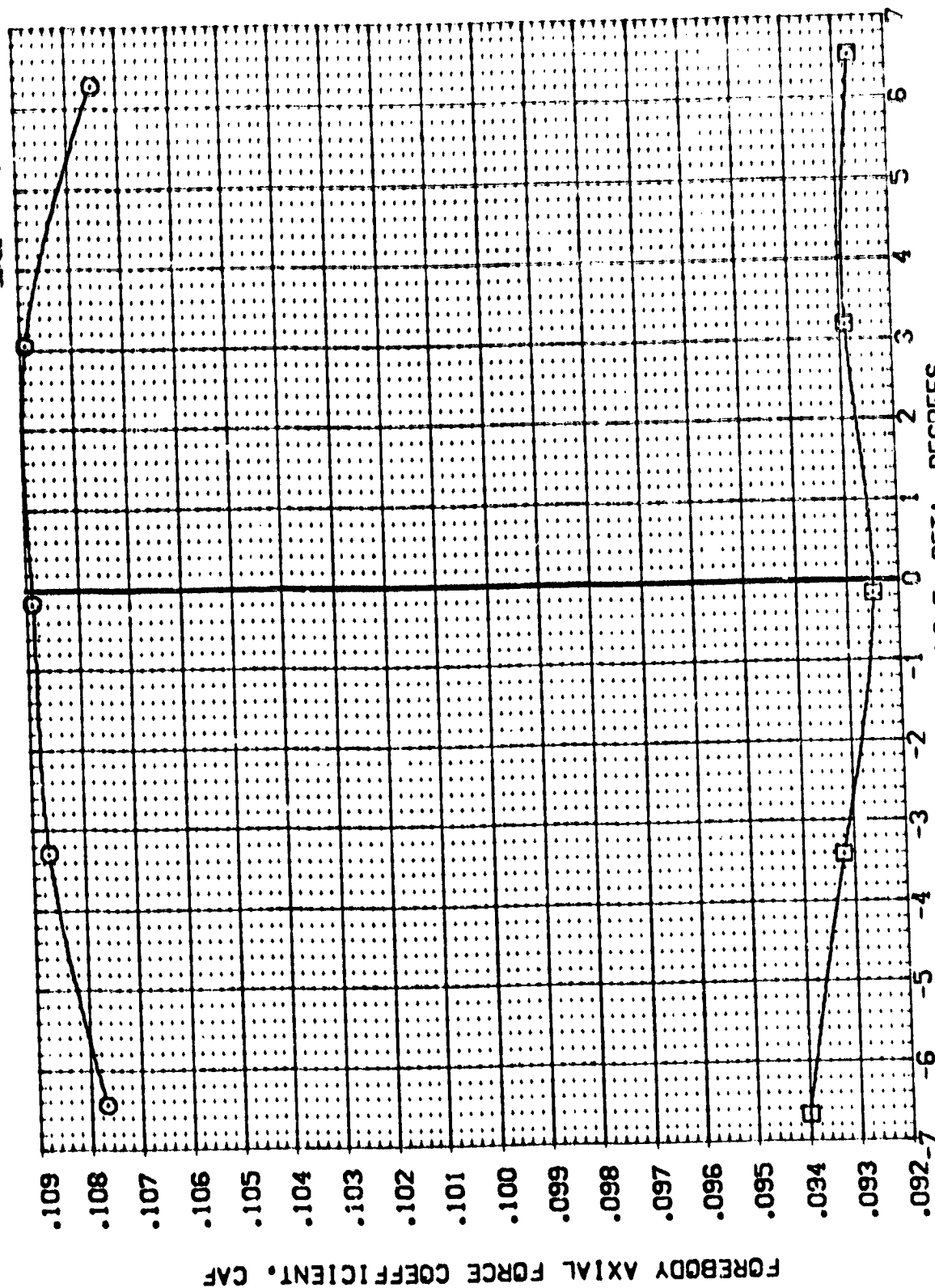


FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, NN=2.5, 3.5

AVES 87-707-CA12 02A

| SYMBOL | MACRO | PARAMETRIC VALUES | |
|--------|-------|-------------------|-----------|
| COL | 2.498 | .000 | ELEVATION |
| | 3.521 | .000 | ROOFER |
| | | | ROOFER |
| | | | 10.000 |
| | | | 40.000 |

| | |
|-------|---------|
| SPT | 7.42 |
| LFE | 29.849C |
| SFC | 29.849C |
| XPR | 17.3C |
| VPO | ~~~~~ |
| ZPO | ~~~~~ |
| SCALE | ~~~~~ |



092-7 -6 -5 -4 -3 -2 -1 0
SIDESLIP ANGLE, BETA, DEGREES
FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, VN=2.5, 3.5
PAGE 459

(793000)

AVES 87-707-CA:2 C2A

SYMBOL WICH PARAMETRIC VALUES
 10.000 2.498 ALPHA 10.000
 3.501 9.00000 ELEVON 40.000
 .000 RUDDER

REFERENCE VALUES
 10.000
 2.498
 3.501
 9.000
 .000
 SCALE



FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, V=2.5, 3.5

(R30008)

AMES 87-707-GA:2 32A

| SYMBOL | WACH | PARAMETRIC VALUES | | |
|--------|-------|-------------------|--------|--------|
| | | ALPHA | ELEVON | RUDDER |
| □ | 2.498 | .000 | 10.000 | |
| | 3.501 | .000 | 40.000 | |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SRF | 2.4210 |
| L REF | 39.8450 |
| B REF | 39.8450 |
| Y REF | 37.3000 |
| Z REF | 37.3000 |
| SCALE | 1.000 |

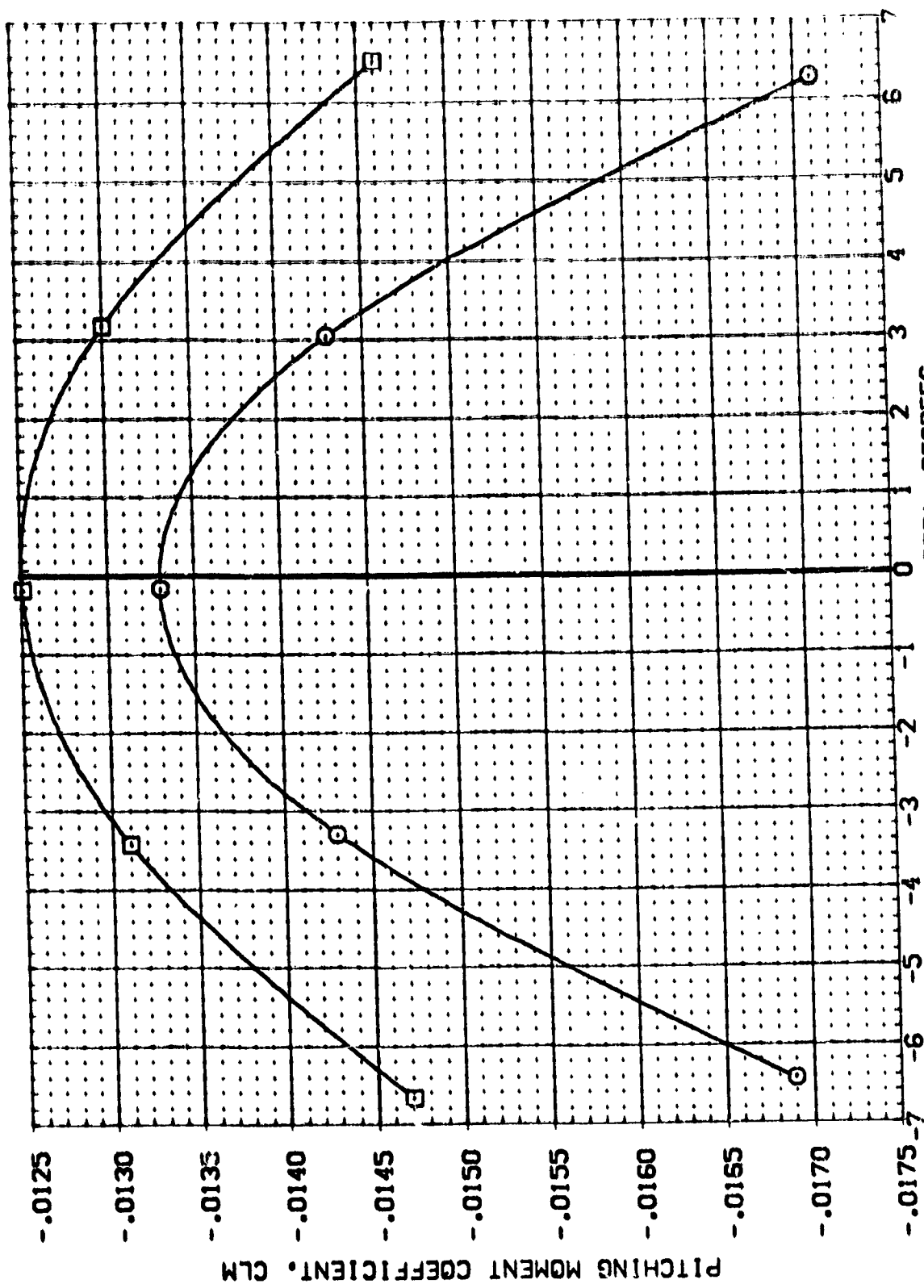


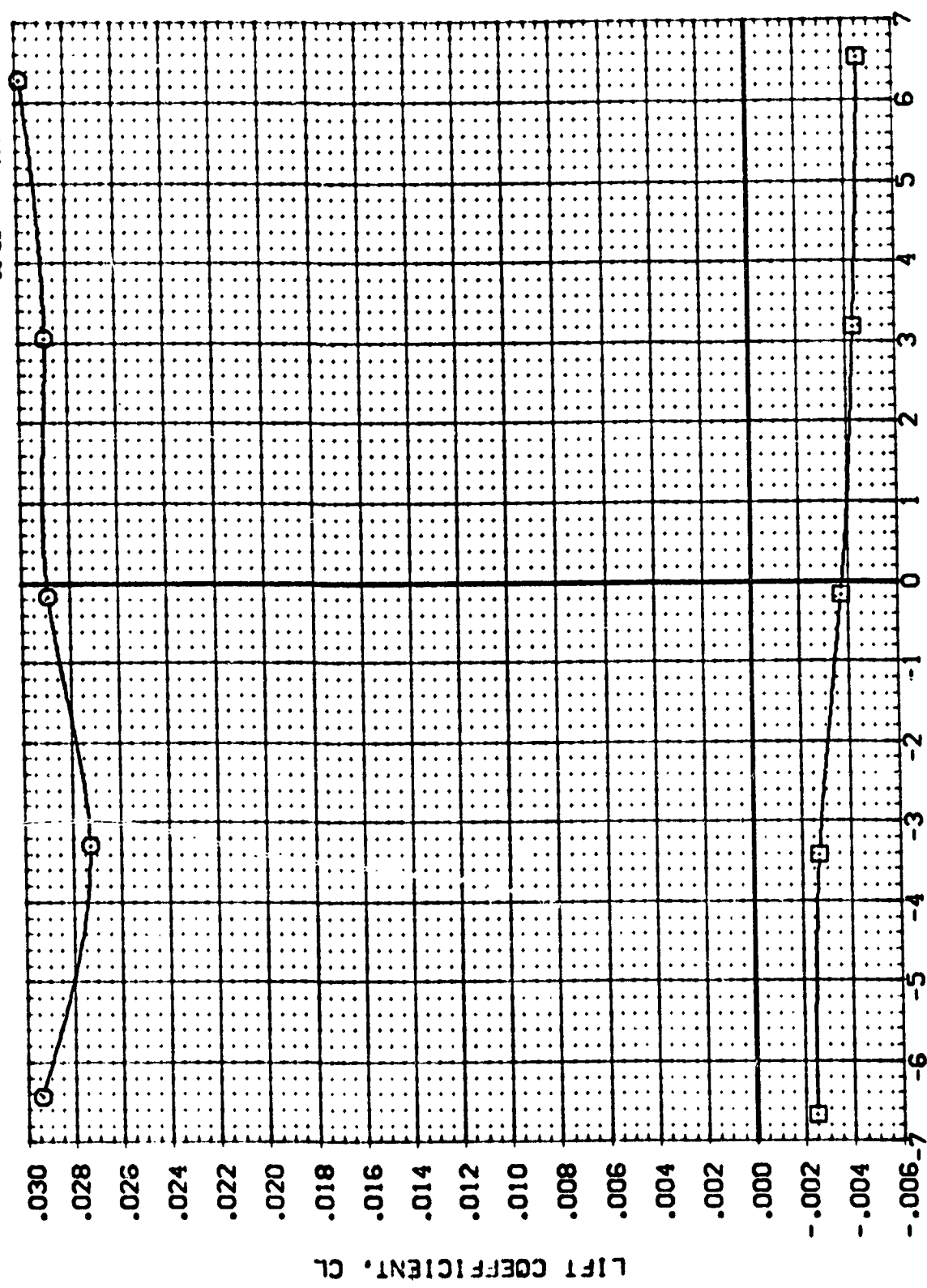
FIG.56 ORBITER LAT-OIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
PAGE 47

[R80008]

AVES 87-707-CA12 02A

REFERENCE INFORMATION
 SREF 2.42°C
 LREF 39.845C
 BREF 39.845C
 XMRP 32.300C
 YMRP 0.000
 ZMRP 0.000
 SCALE 0.000

PARAMETRIC VALUES
 WAC 2.498
 ALPHA 0.000
 ELEVON 10.000
 RUDDER 0.000
 RUOFLR 40.000



SIDESLIP ANGLE, BETA, DEGREES

FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RB0008)

AVES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| | | ALPHA | ELEVON |
| □ | 2.498 | .000 | 10.000 |
| ○ | 3.501 | .000 | 40.000 |

REFERENCE INFORMATION

| | 2.471C | 30.8490 | 32.3000 | 0.0000 | 0.0000 | 0.0000 |
|-------|--------|---------|---------|--------|--------|--------|
| SREF | | | | | | |
| LREF | | | | | | |
| BREF | | | | | | |
| XWPP | | | | | | |
| YWPP | | | | | | |
| ZWPP | | | | | | |
| SCALE | | | | | | |

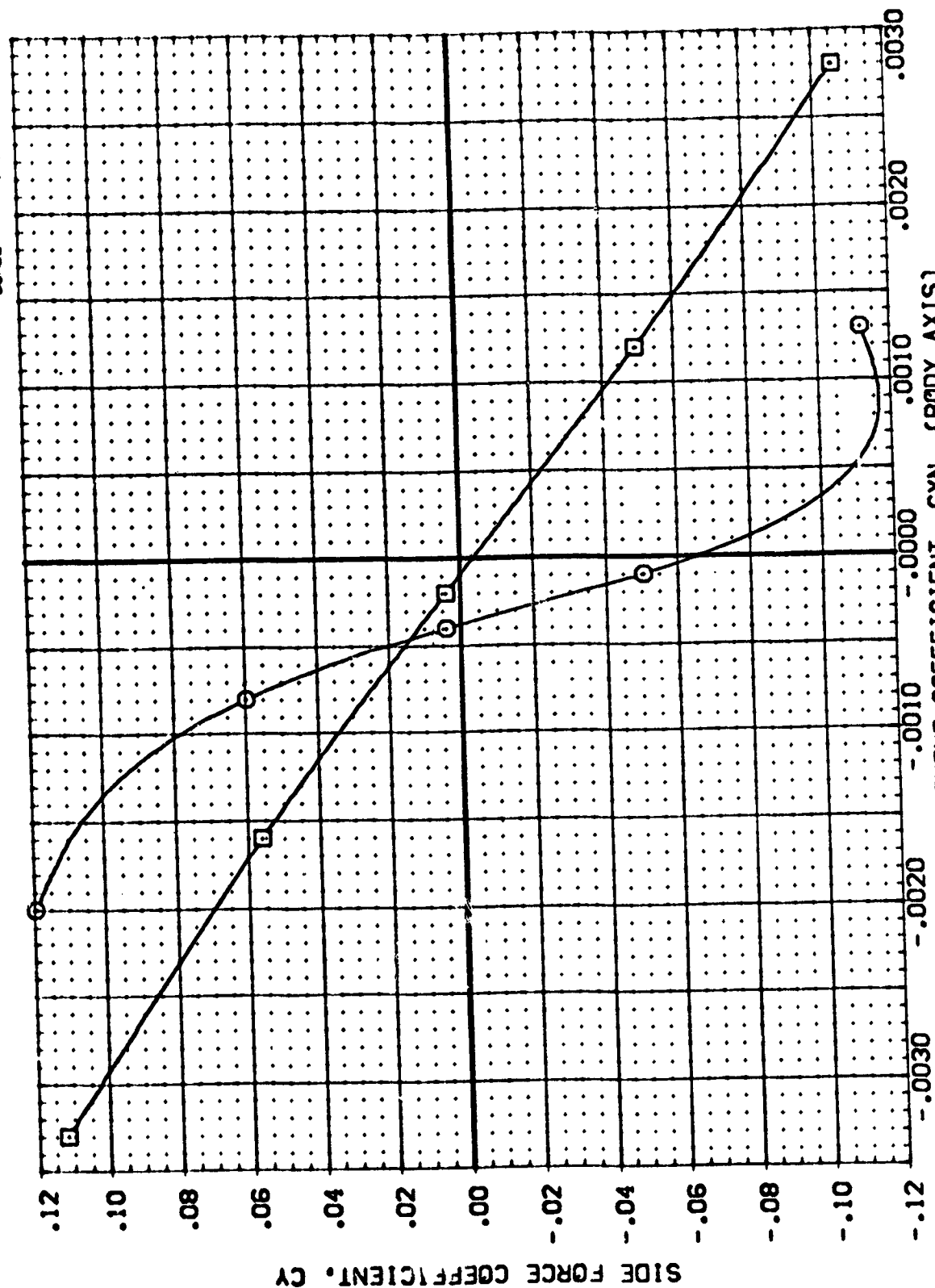


FIG.56 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R80009)

AVES 87-707-CA12 02A

SYMBOL
□ ○

WACH 2.498
3.501

ALPHA 10.000
RUDDER 40.000

PARAMETRIC VALUES
ELEVON 10.000
RUOFLR 40.000

REFERENCE INFORMATION
SPREF 2.421C
LRREF 39.849C
BRREF 39.849C
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

SC.FT.
SCALE

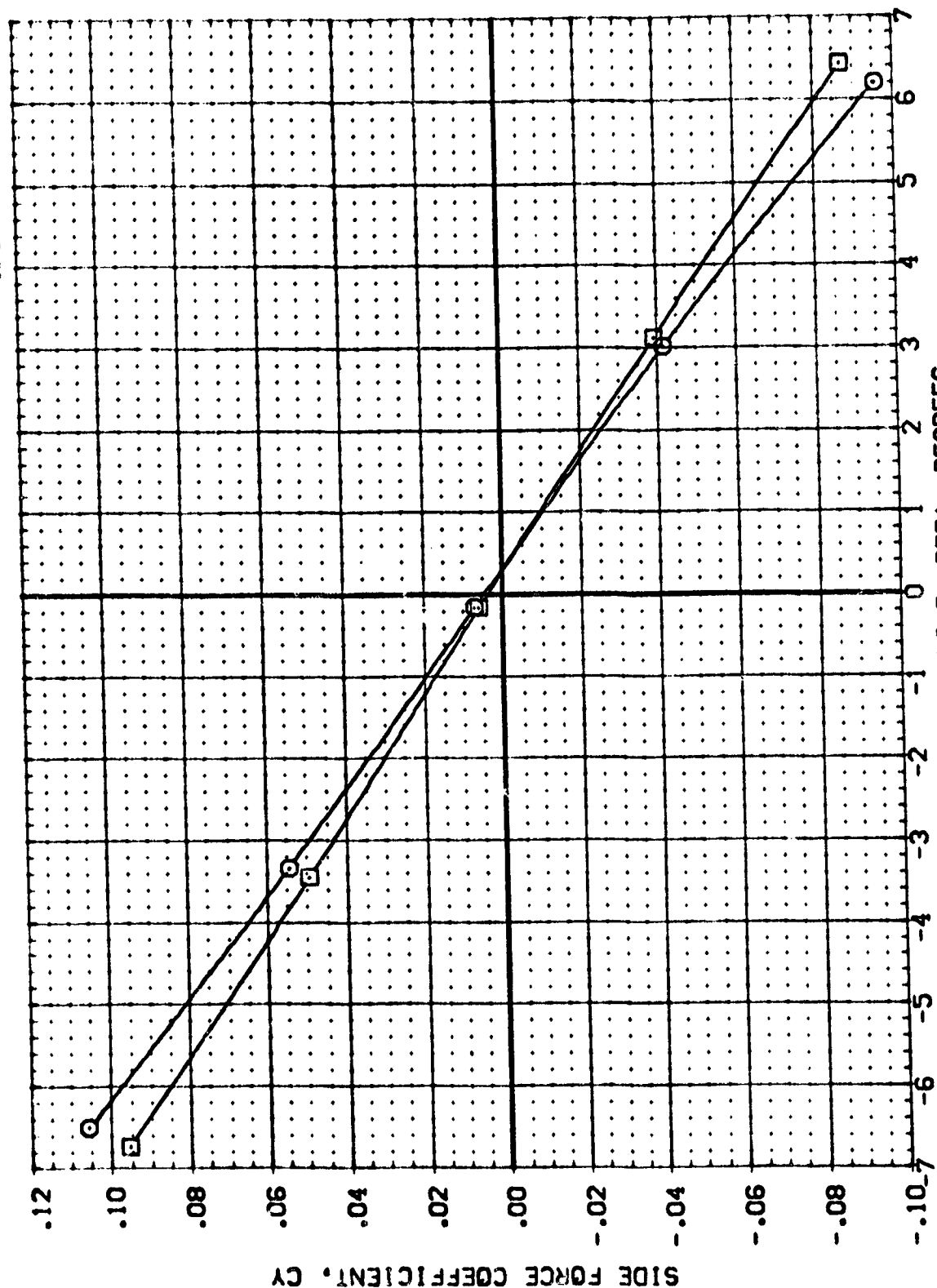


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

PAGE 474

(RB00009)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDER
O 2.498 10.000
□ 3.500 40.000

PARAMETRIC VALUES
ELEVON 10.000
RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0000

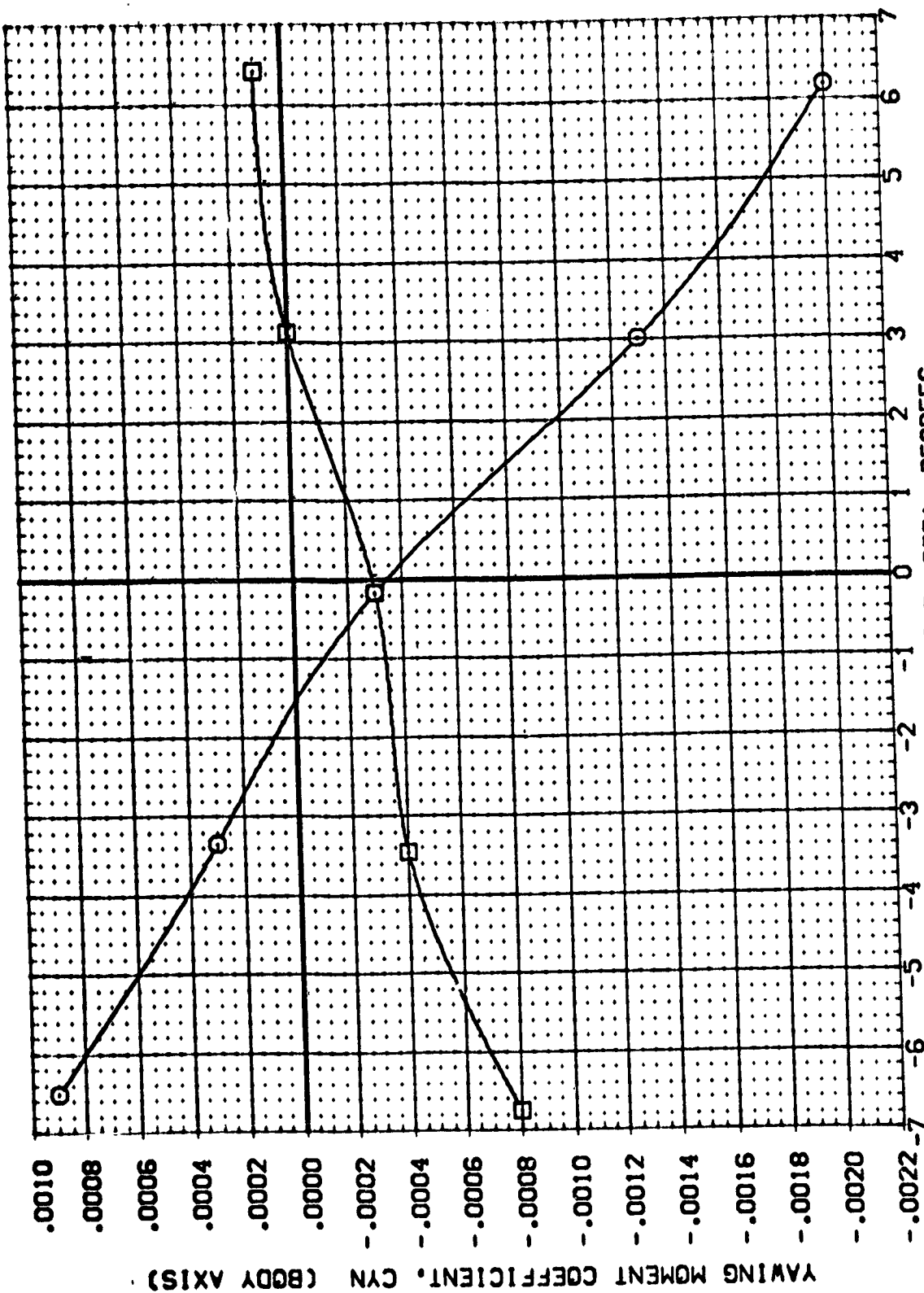


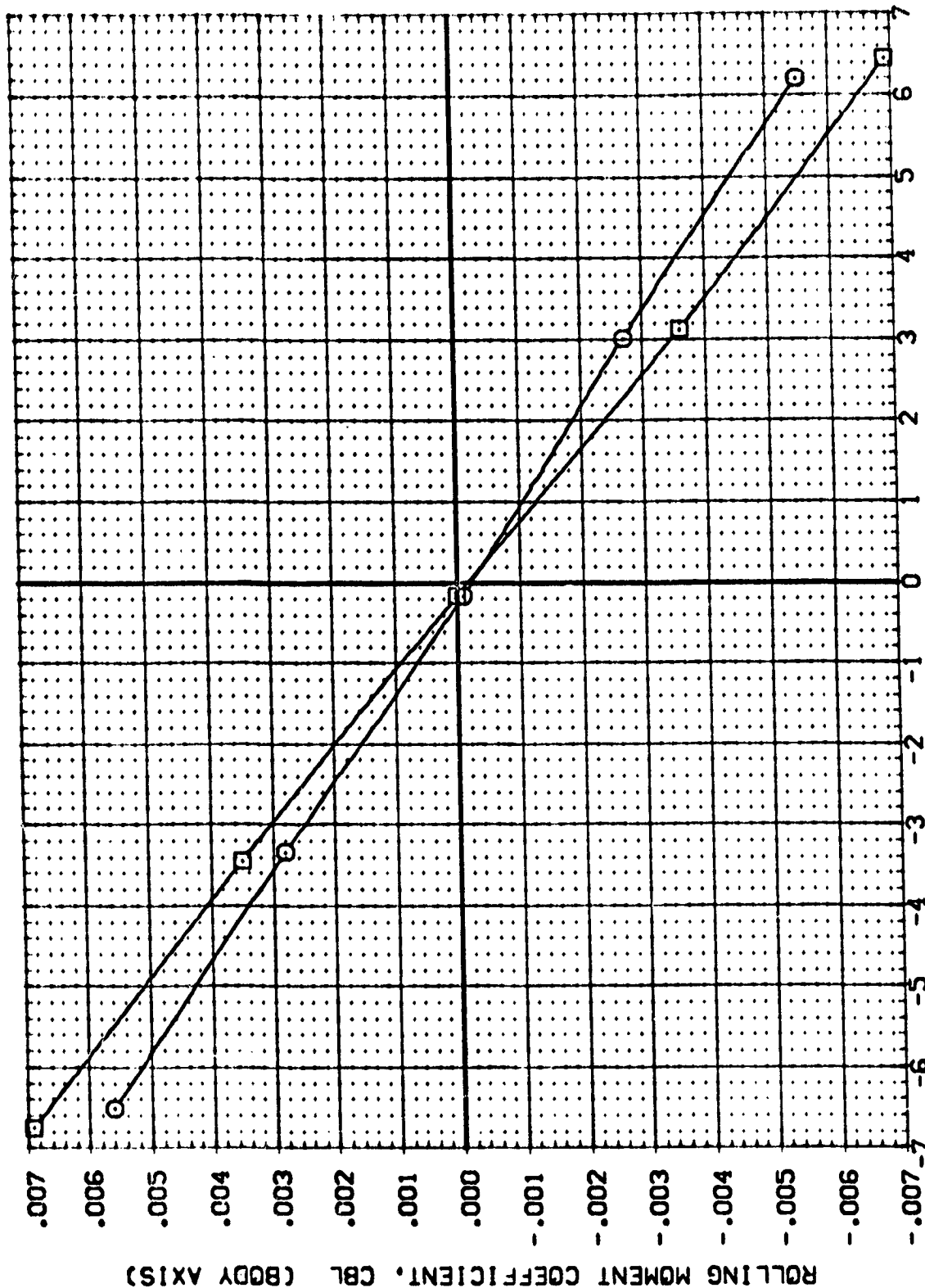
FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R00009)

AVES 87-707-CA12 02A

SYMBOL MACH 2.498 ALPHA 10.000 ELEVON 10.000
 3.500 RUDDER 40.000

REFERENCE INFORMATION
 SPREF 2.4212
 LREF 39.845C
 BREF 39.845C
 XMRD 32.3000
 YMRD .0000
 ZMRD .0000
 SCALE .0300



SIDESLIP ANGLE, BETA, DEGREES

FIG.57 ORBITER LAT-DIR. AERO DATA. ALPHA=10, RUDDER=-20, ELEVON=10 DEGS. MN=2.5, 3.5

(RBQ0009)

AMES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| | | ALPHA | ELEVON |
| ○ | 2.498 | 10.000 | 10.000 |
| □ | 3.501 | .000 | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SRF | SC.FT. |
| 1.REF | 2.4210 |
| 2.REF | 39.8410 |
| 3.REF | 39.8410 |
| 4.REF | 32.3000 |
| 5.REF | .0000 |
| 6.REF | .0000 |
| 7.REF | .0000 |
| 8.REF | .0000 |
| 9.REF | .0000 |
| 10.REF | .0000 |
| 11.REF | .0000 |
| 12.REF | .0000 |
| 13.REF | .0000 |
| 14.REF | .0000 |
| 15.REF | .0000 |
| 16.REF | .0000 |
| 17.REF | .0000 |
| 18.REF | .0000 |
| 19.REF | .0000 |
| 20.REF | .0000 |
| 21.REF | .0000 |
| 22.REF | .0000 |
| 23.REF | .0000 |
| 24.REF | .0000 |
| 25.REF | .0000 |
| 26.REF | .0000 |
| 27.REF | .0000 |
| 28.REF | .0000 |
| 29.REF | .0000 |
| 30.REF | .0000 |
| 31.REF | .0000 |
| 32.REF | .0000 |
| 33.REF | .0000 |
| 34.REF | .0000 |
| 35.REF | .0000 |
| 36.REF | .0000 |
| 37.REF | .0000 |
| 38.REF | .0000 |
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| 40.REF | .0000 |
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| 42.REF | .0000 |
| 43.REF | .0000 |
| 44.REF | .0000 |
| 45.REF | .0000 |
| 46.REF | .0000 |
| 47.REF | .0000 |
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| 49.REF | .0000 |
| 50.REF | .0000 |
| 51.REF | .0000 |
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| 54.REF | .0000 |
| 55.REF | .0000 |
| 56.REF | .0000 |
| 57.REF | .0000 |
| 58.REF | .0000 |
| 59.REF | .0000 |
| 60.REF | .0000 |
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| 74.REF | .0000 |
| 75.REF | .0000 |
| 76.REF | .0000 |
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| 78.REF | .0000 |
| 79.REF | .0000 |
| 80.REF | .0000 |
| 81.REF | .0000 |
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| 83.REF | .0000 |
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| 85.REF | .0000 |
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| 87.REF | .0000 |
| 88.REF | .0000 |
| 89.REF | .0000 |
| 90.REF | .0000 |
| 91.REF | .0000 |
| 92.REF | .0000 |
| 93.REF | .0000 |
| 94.REF | .0000 |
| 95.REF | .0000 |
| 96.REF | .0000 |
| 97.REF | .0000 |
| 98.REF | .0000 |
| 99.REF | .0000 |
| 100.REF | .0000 |

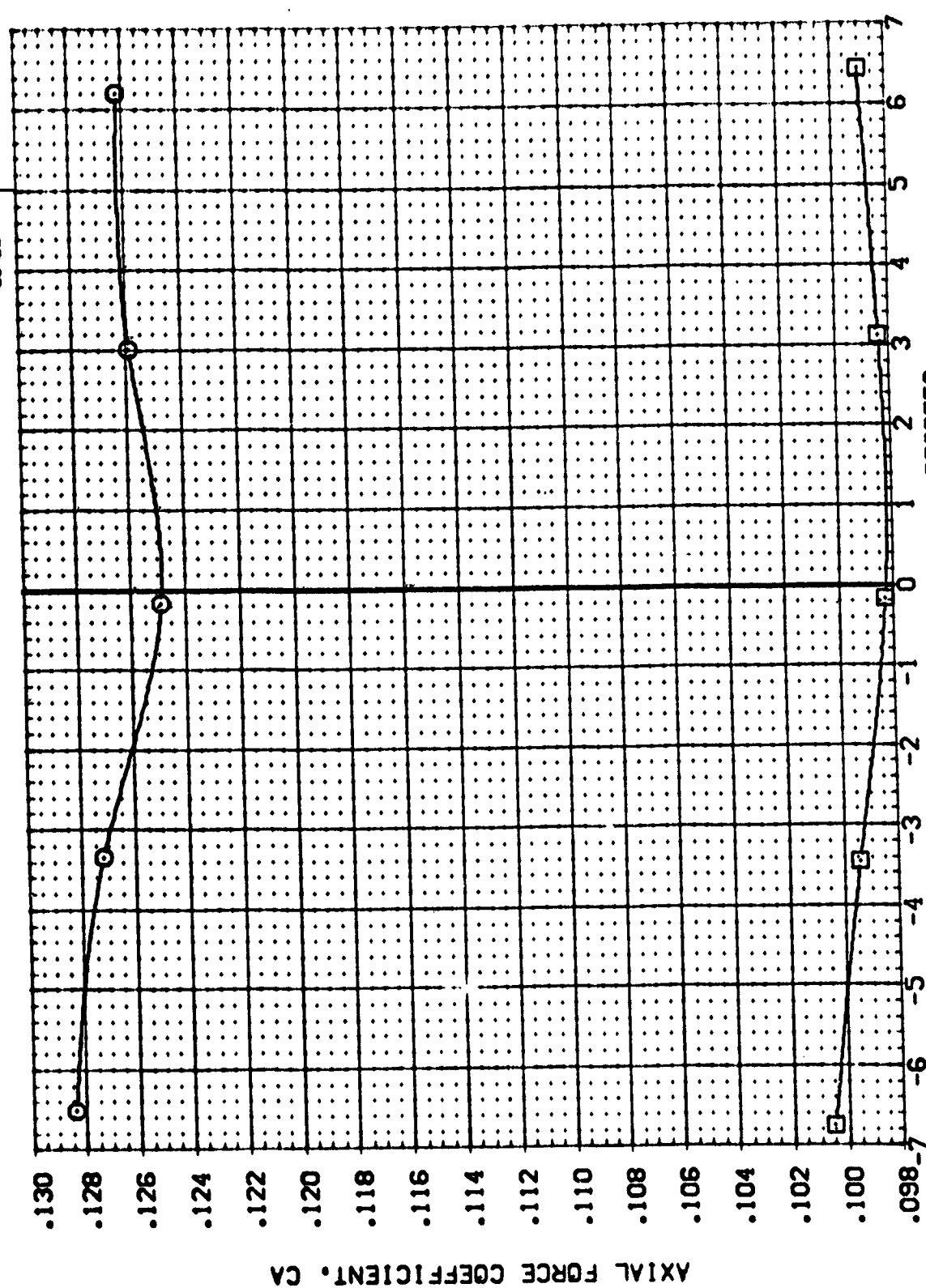


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R80009)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER ELEVON RUDDER SCALE
2.498 3.501 10.000 10.000 10.000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300

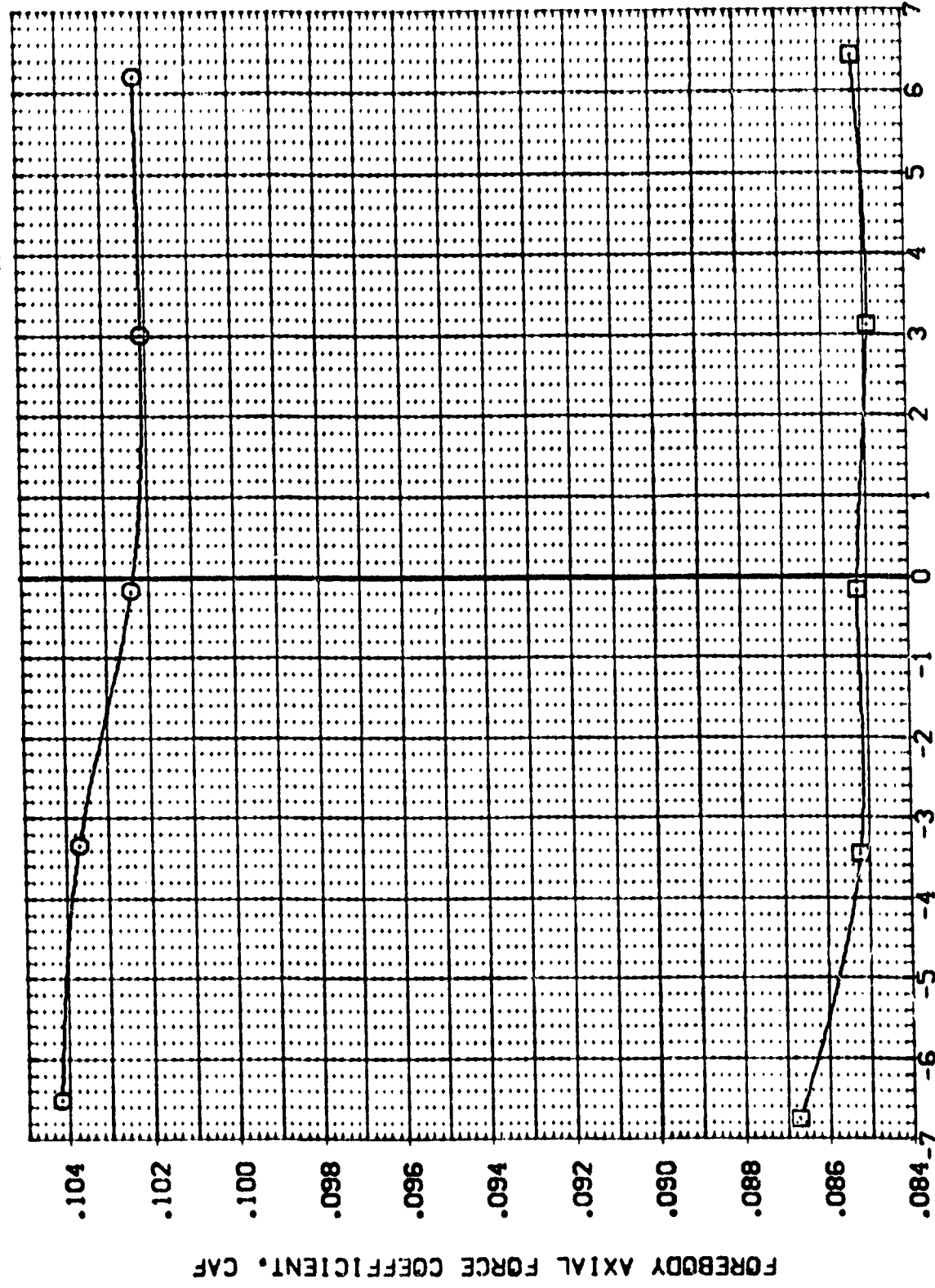


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

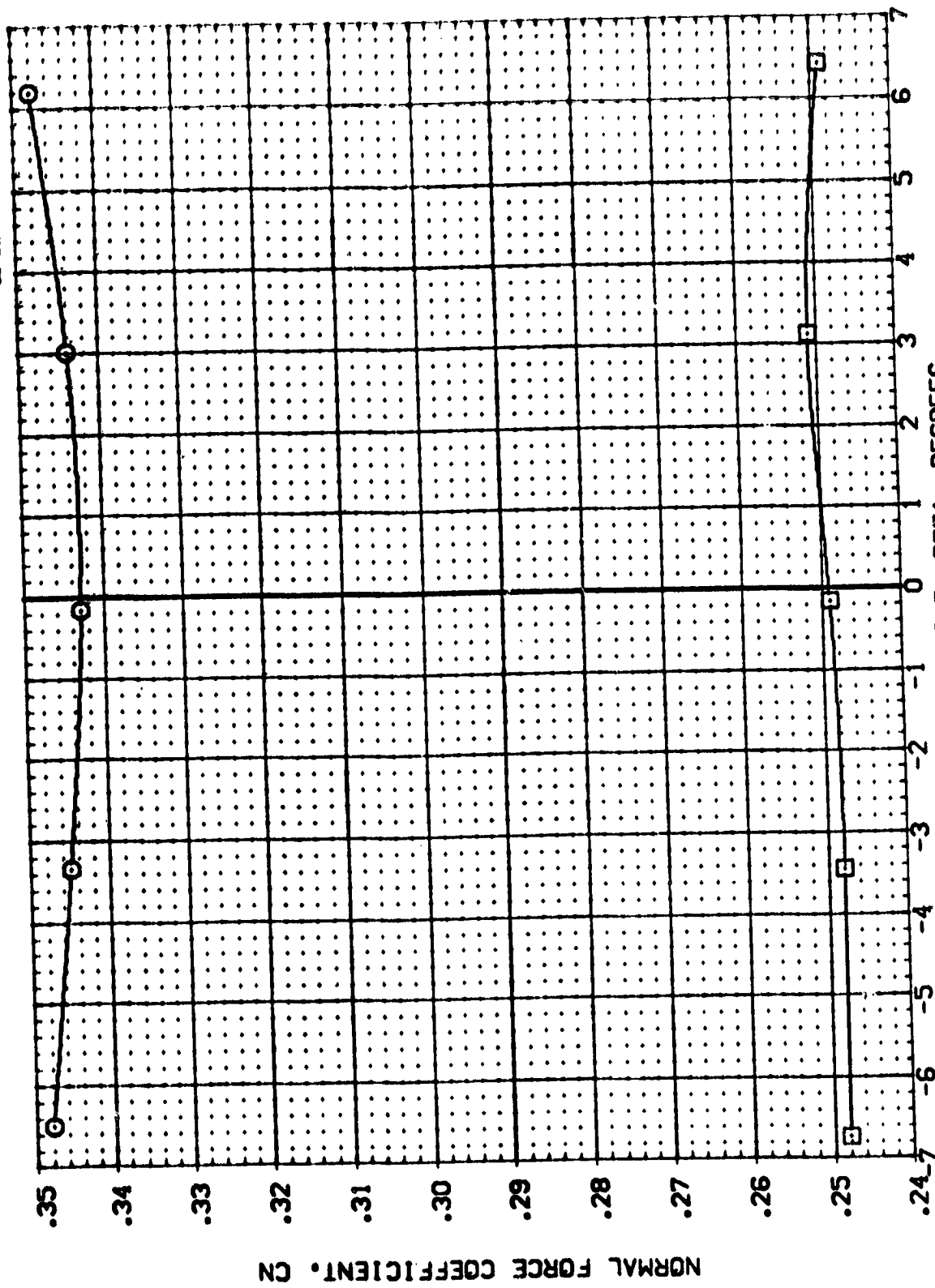
(R8Q009)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER
□ 2.498 10.000 .000
□ 3.551 10.000 40.000

PARAMETRIC VALUES
ELEVON 10.000
RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4212
LREF 38.845C
BREF 38.845C
XREF 32.300C
YREF .000C
ZREF .000C
SCALE .000C



SIDESLIP ANGLE, BETA, DEGREES

FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R880009)

AVES 87-707-CA12 02A

SYMBOL MAC ALPHA RUDDER
2.498
-1.501

PARAMETRIC VALUES
10.000 ELEVON
.000 RUDFLR
10.000

REFERENCE INFORMATION
SPREF 2.4210
LREF 39.849C
BREF 39.849C
XPRP 32.300C
YPRP 1.000C
ZPRP 1.000C
SCALE 1.300

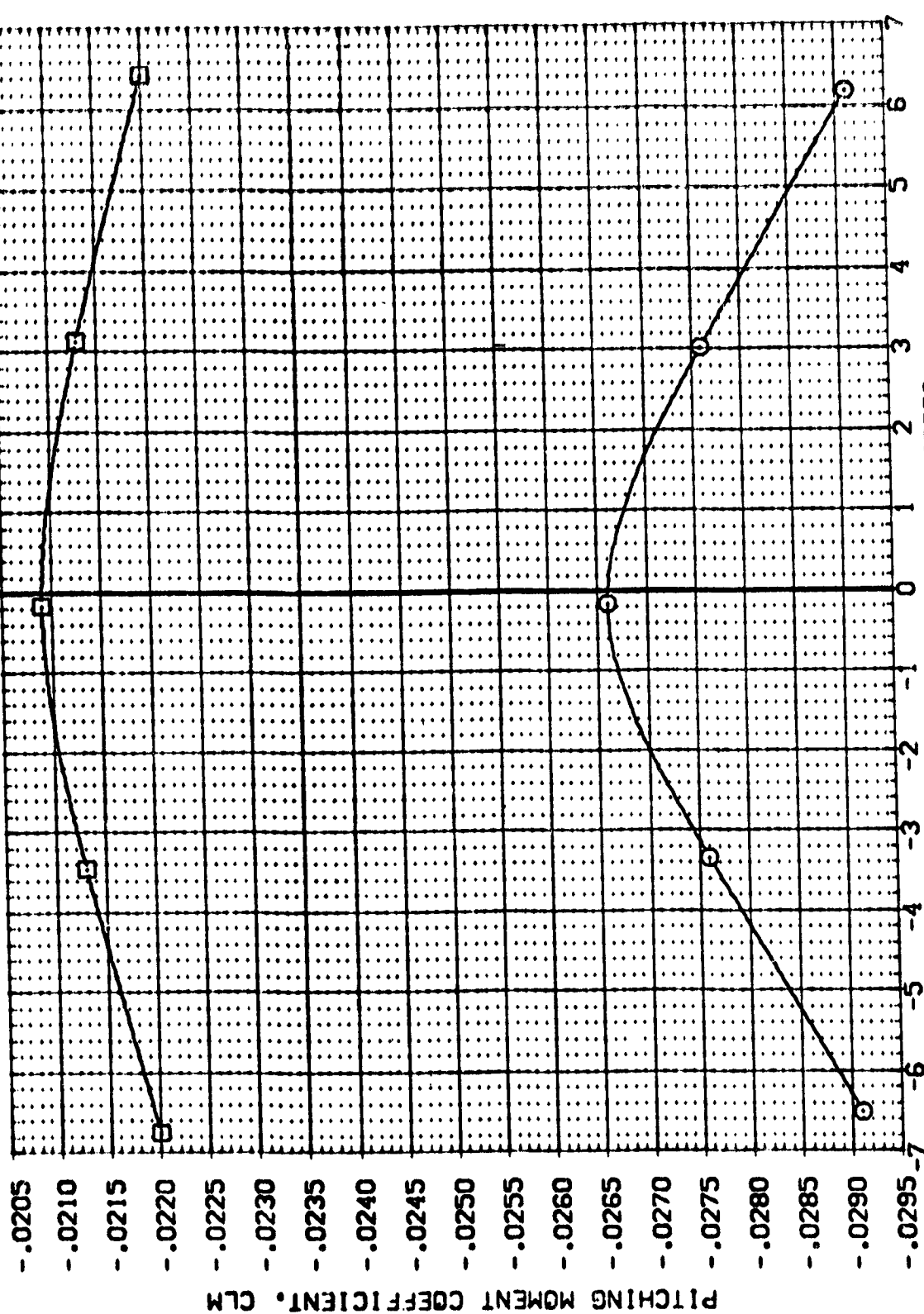


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RBQ0009)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 40.000
 2.498 10.000 .000 RUDFLR
 3.501 RUDDER

REFERENCE INFORMATION
SREF 2.421C
LREF 29.845C
BREF 39.845C
XREF 32.300C
YREF .000C
ZREF .000C
SCALE .000C

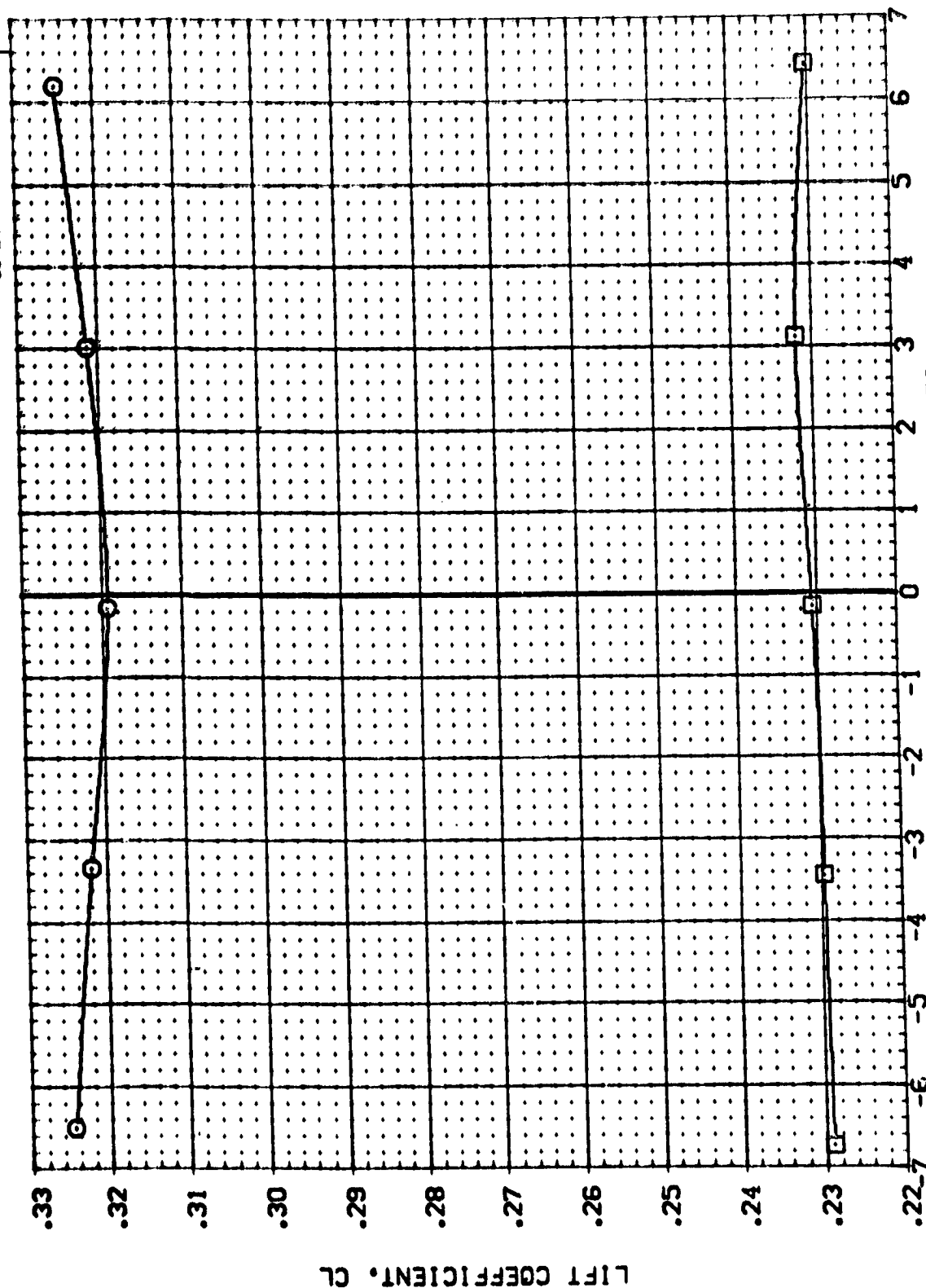


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R30009)

AVES 87-707-CA12 C2A

| | | | | | |
|--------|-------|-------------------|--------|--------|--------|
| SYMBOL | WACH | PARAMETRIC VALUES | 10.000 | ELEVON | 10.000 |
| ○ | 2.498 | ALPHA | .000 | RUDDER | 40.000 |
| □ | 3.501 | RUDDER | | | |

| | |
|-----------------------|---------|
| REFERENCE INFORMATION | |
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRP | 32.3000 |
| YPRP | 0.0000 |
| ZPRP | 0.0000 |
| SCALE | 0.0000 |

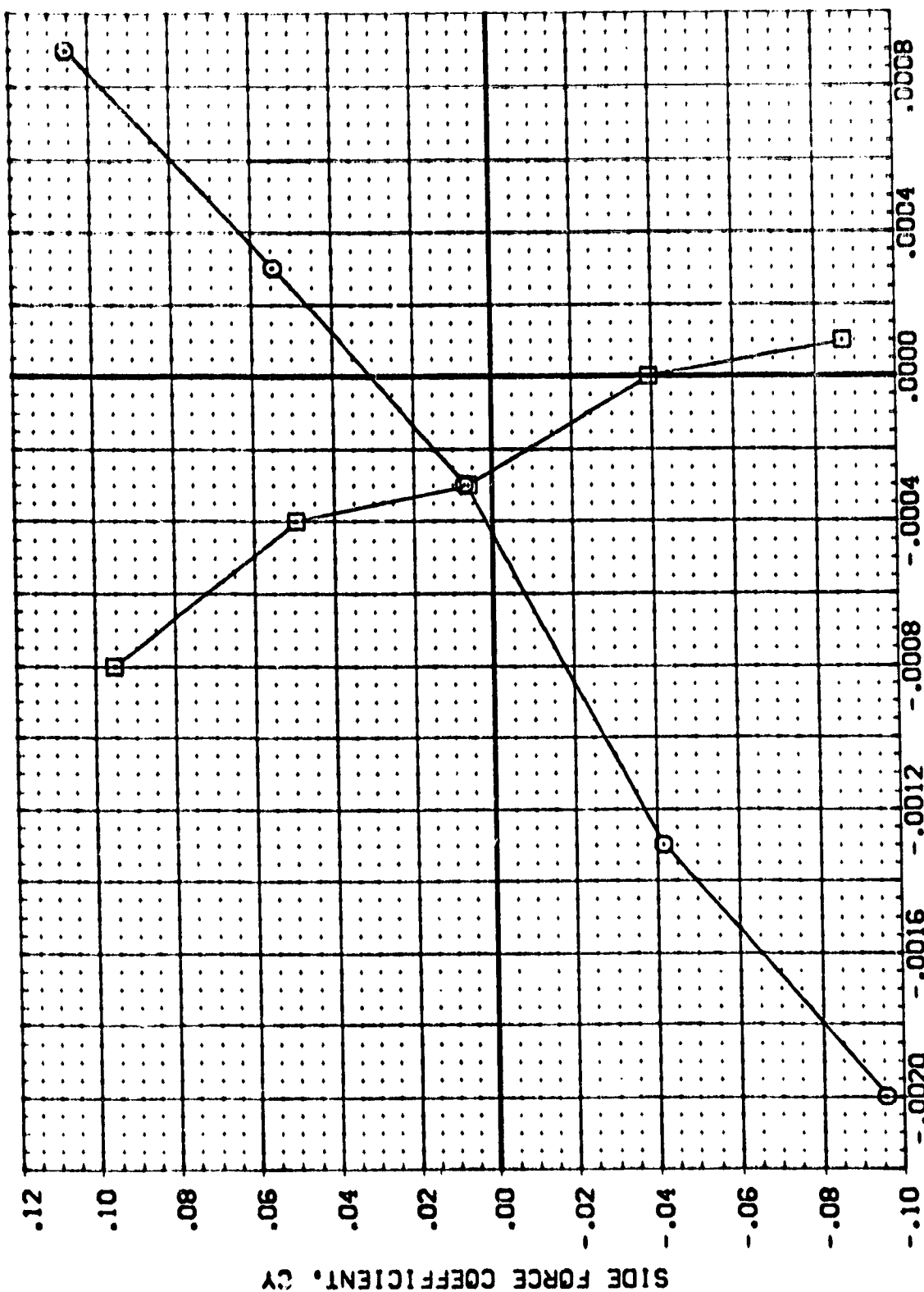


FIG.57 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=10 DEGS. $\gamma_N=2.5, 3.5$

==

(R3301C)

AMES 87-7C7-0A12 C2A

SYMBOL: \square WACH: 2.498 3.501
 PARAMETRIC VALUES: ALPHA: 20.000 20.000 ELEVON: 10.000 40.000 RUDDER: .000 .000

REFERENCE INFORMATION:
 SREF: 2.4710
 LREF: 39.815C
 BREF: 39.815C
 XREF: 37.300C
 YREF: .0000
 ZREF: .0000
 SCALE: .0000

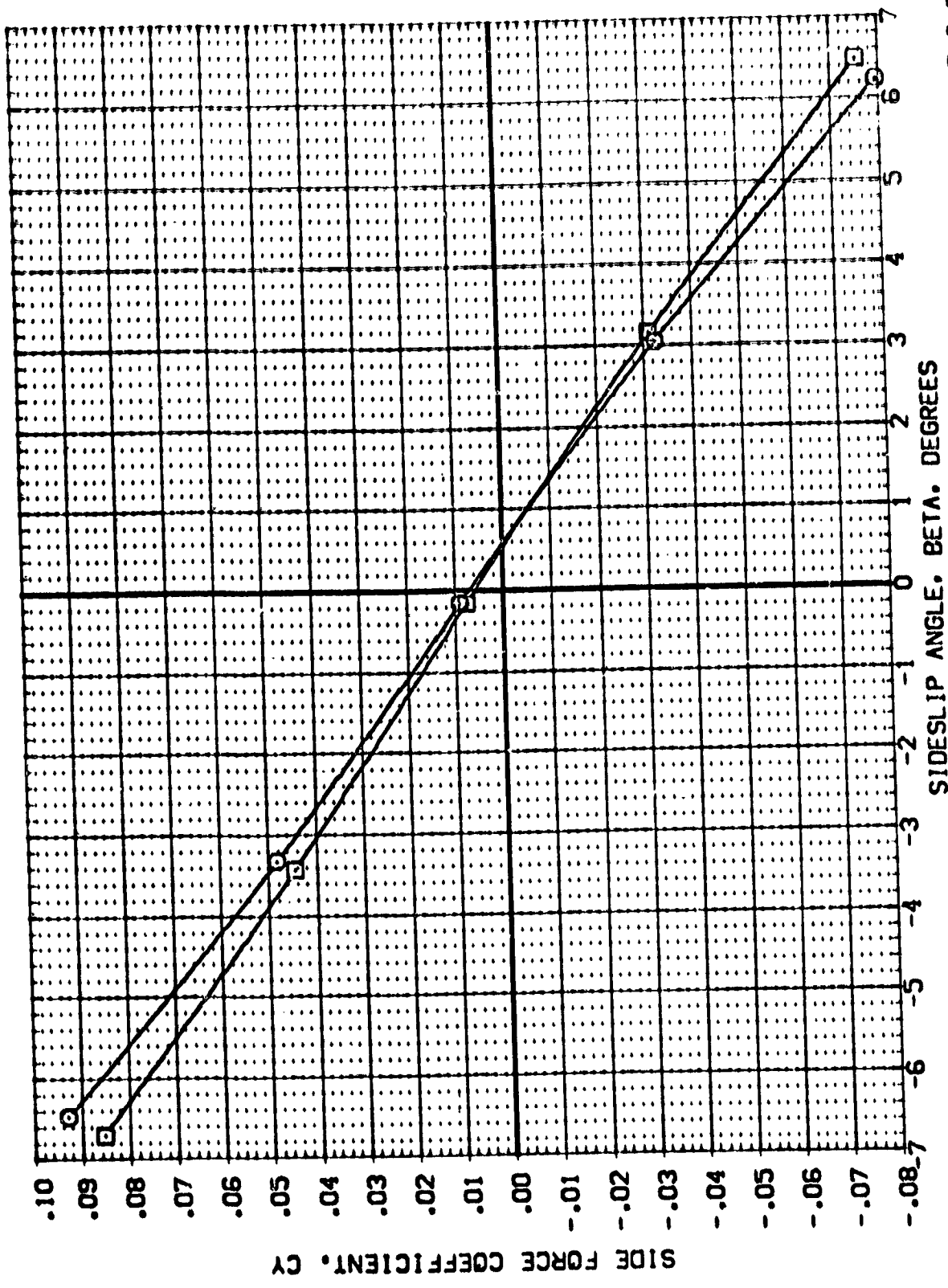


FIG.58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
 PAGE 483

AMES 87-707-GA12

| SY80 | WQ | PARAMETRIC VALUES |
|-------|-------|-------------------|
| 2.498 | ALPHA | 20.000 ELEV |
| 3.500 | RODER | .000 ROELR |
| | | 10.000 |
| | | 40.000 |

CIVIL SERVICE

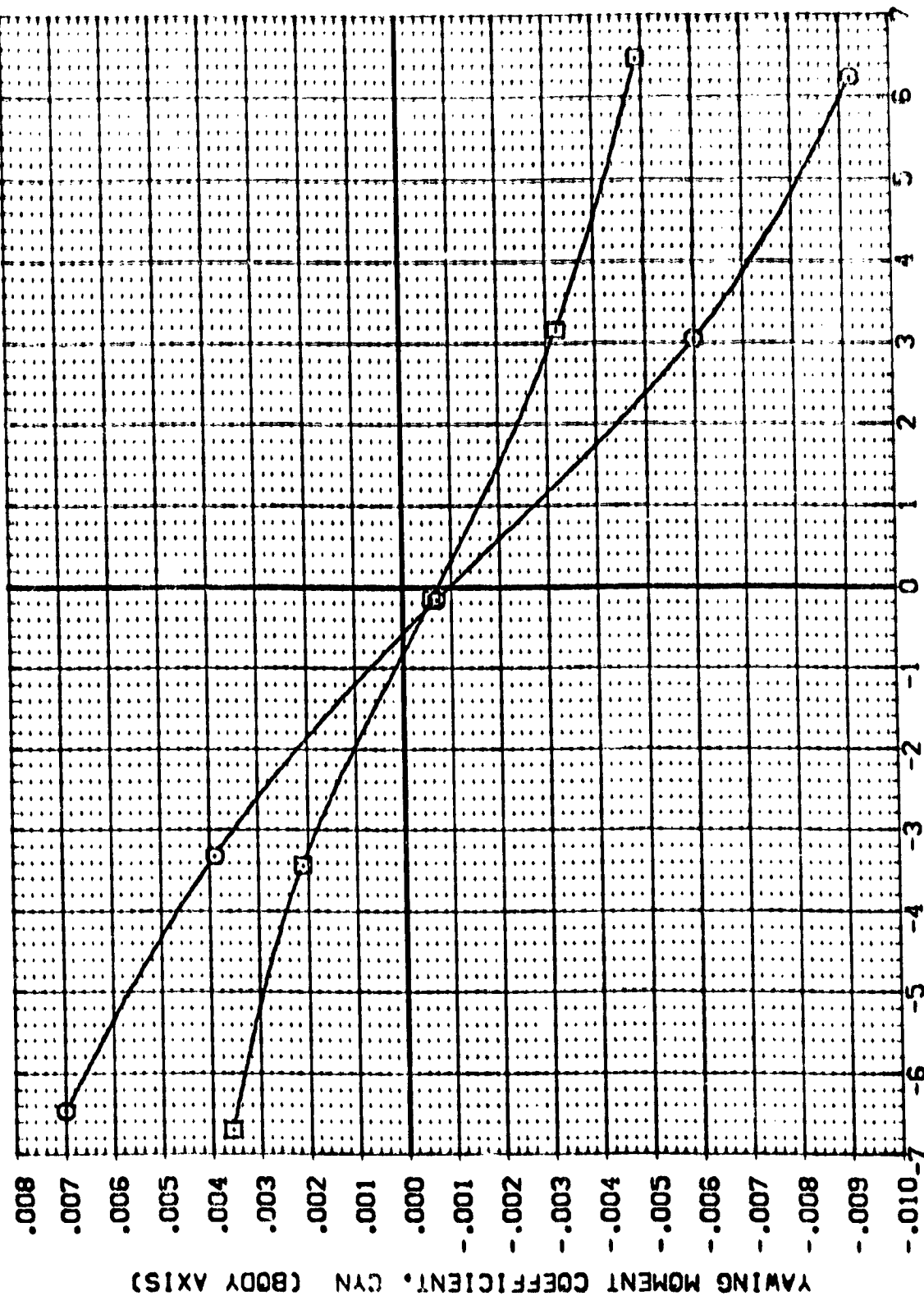


FIG. 58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, $\gamma=2.5, 3.5$

AMES 87-707-CA:2 32A

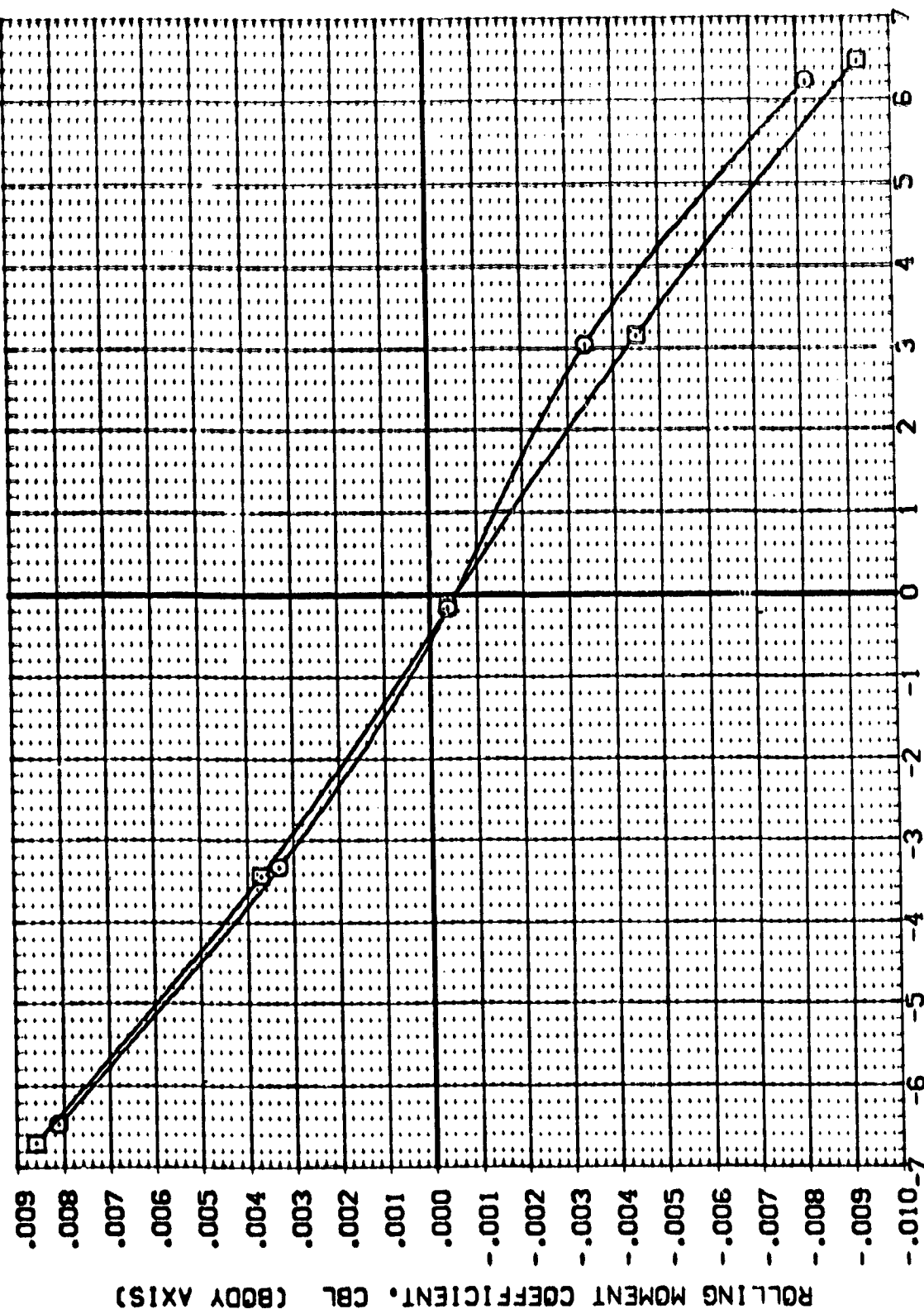
[illegible]

FIG.58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, $M=2.5, 3.5$
SIDESLIP ANGLE, BETA, DEGREES

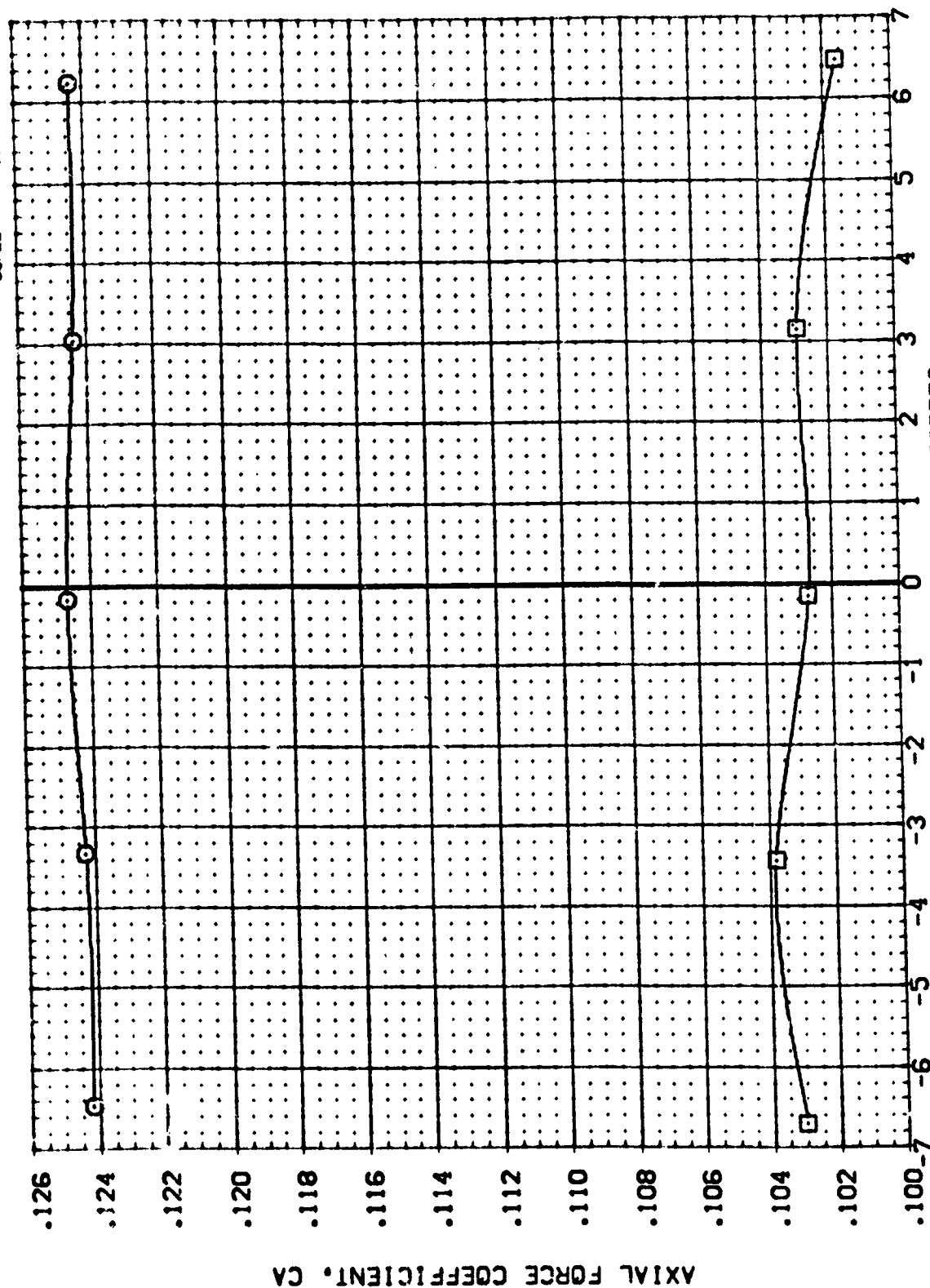
(RBG010)

AMES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | | SCALE |
|--------|-------|-------------------|--------|--------|
| | | ALPHA | ELEVON | |
| □ | 2.490 | 20.000 | 10.000 | 10.000 |
| | 3.500 | .000 | 40.000 | |

REFERENCE INFORMATION

| SYMBOL | SCALE | SCALE |
|--------|---------|--------|
| SREF | 2.4200 | SG.FT. |
| LREF | 38.8490 | |
| BREF | 38.8490 | |
| XREF | 37.3000 | |
| YREF | .0000 | |
| ZREF | .0000 | |
| SCALE | .0000 | |



SIDESLIP ANGLE, BETA, DEGREES

FIG.58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

III

AMES 87-707-CA12 02A

(RB0010)

REFERENCE INFORMATION
 SREF 2.4710
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

SYMBOL MACH ALPHA RUDDER
 □ 2.498 20.000 .000
 □ 3.501 40.000 40.000

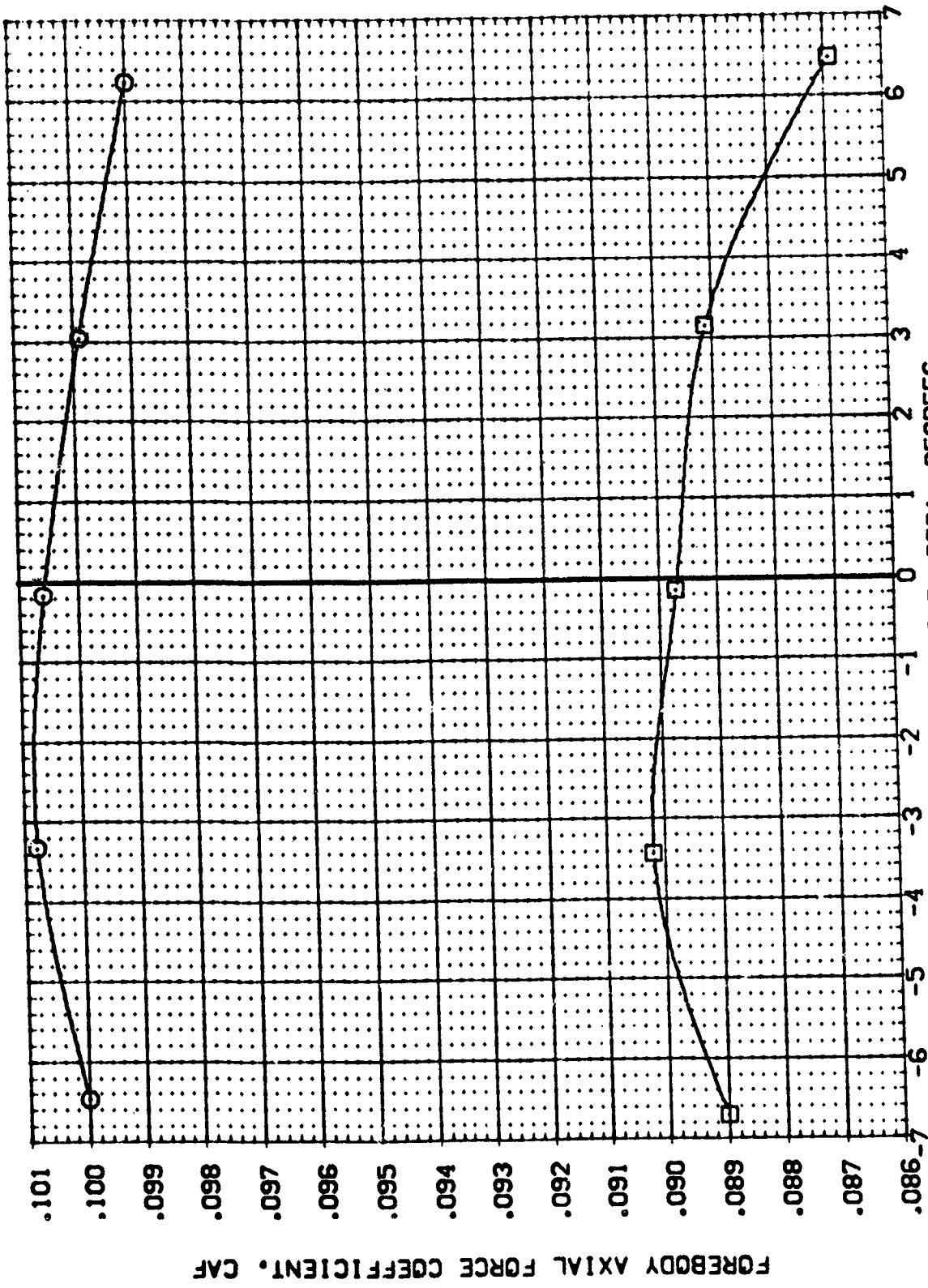


FIG. 58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 487

(R80010)

AVES 87-707-CA.2 CZA

SYMBOL: ☐ ☐ ☐
MACH: 2.498
3.501
PARAMETRIC VALUES
ALPHA: 20.000
ELEVON: 10.000
RUDDER: .000
RJD/LR: 40.000

REFERENCE INFORMATION
SREF: 7.4210
LREF: 39.8490
BREF: 39.8490
XMRP: 32.3000
YMRP: .0000
ZMRP: .0000
SCALE: .0300

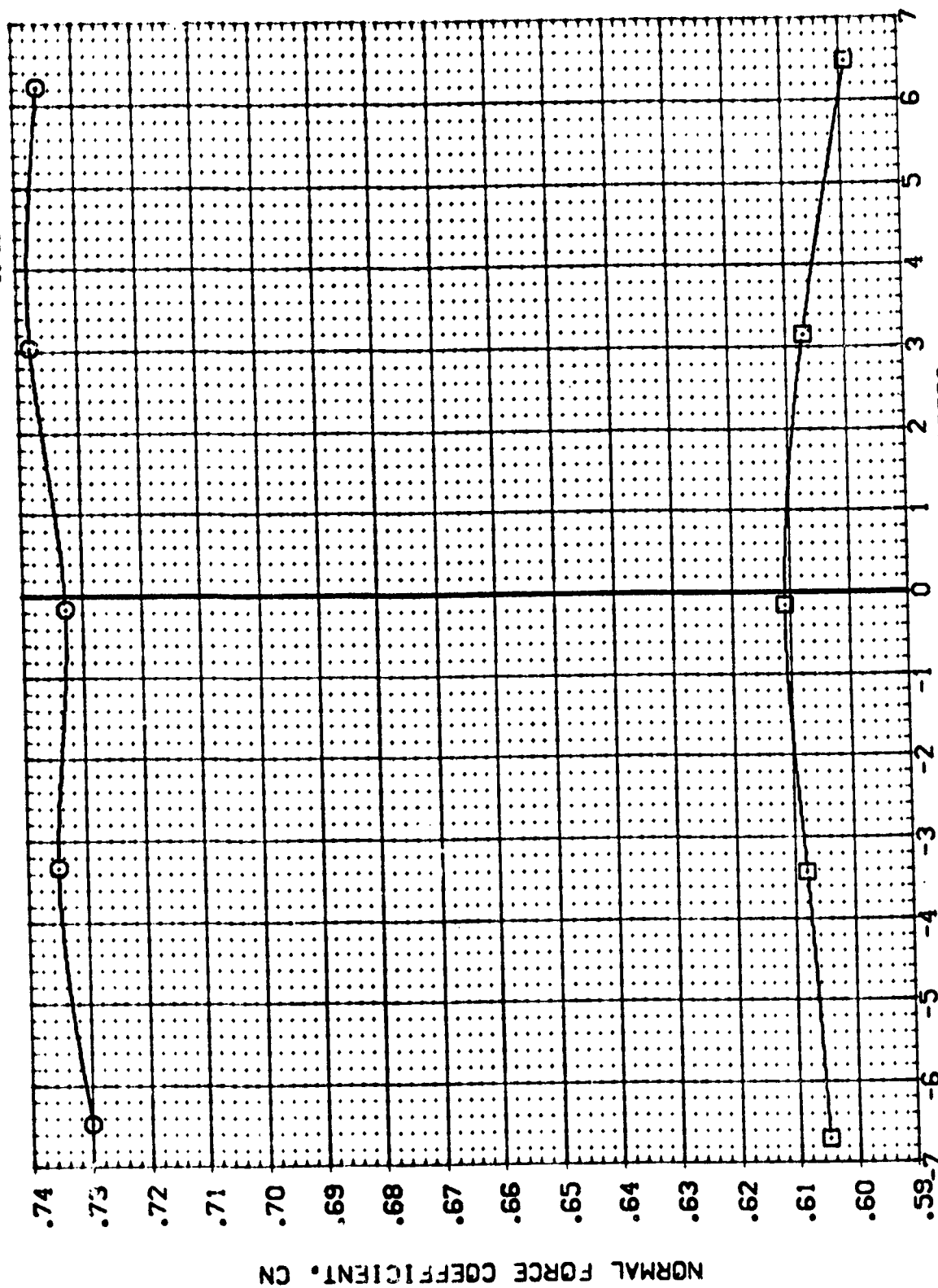


FIG.58 ORBITER LAT-DIR. AERO DATA. ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RBG010)

AMES 87-707-GA12 C2A

SYMBOL MACH ALPHA RUDER
○ 2.498 3.501
□ 20.000 .000 10.000 40.000

PARAMETRIC VALUES

20.000 ELEVON

.000 RUDFLR

10.000

40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP .0000
ZPRP .0000
SCALE .0300

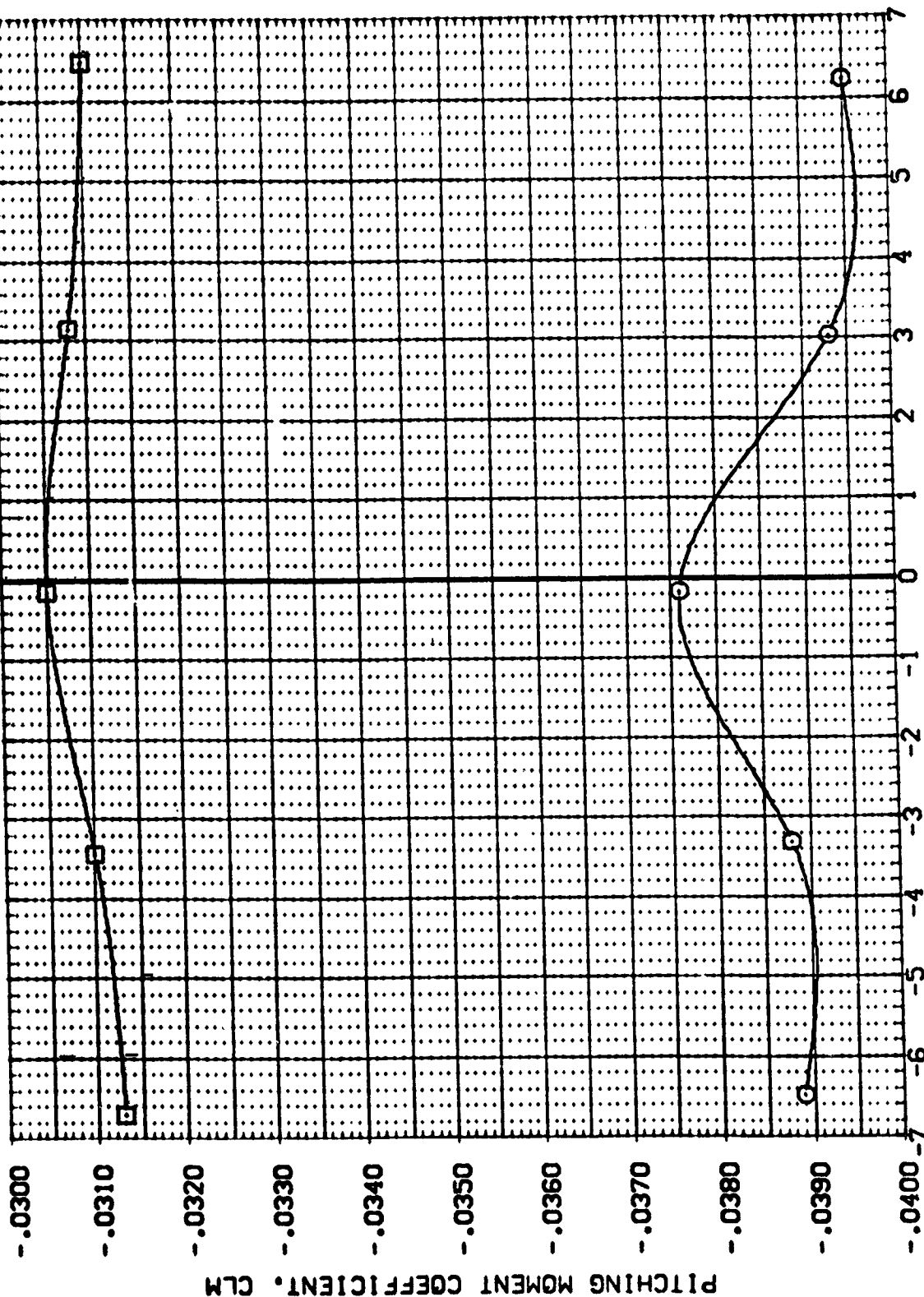


FIG.58 ORBITER LAT-DIR. AERO DATA. ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RB001C)

AMES 87-707-0A12 C2A

SYMBOL: 2.498 3.501
MACH: 2.498 3.501
PARAMETRIC VALUES: 20.000 10.000
ALPHA: 20.000 10.000
RUDDER: 20.000 10.000

REFERENCE INFORMATION:
SREF: 2.4210
LREF: 39.8450
BREF: 39.8450
XMPD: 32.3000
YMPD: .0000
ZMPD: .0000
SCALE: .0300

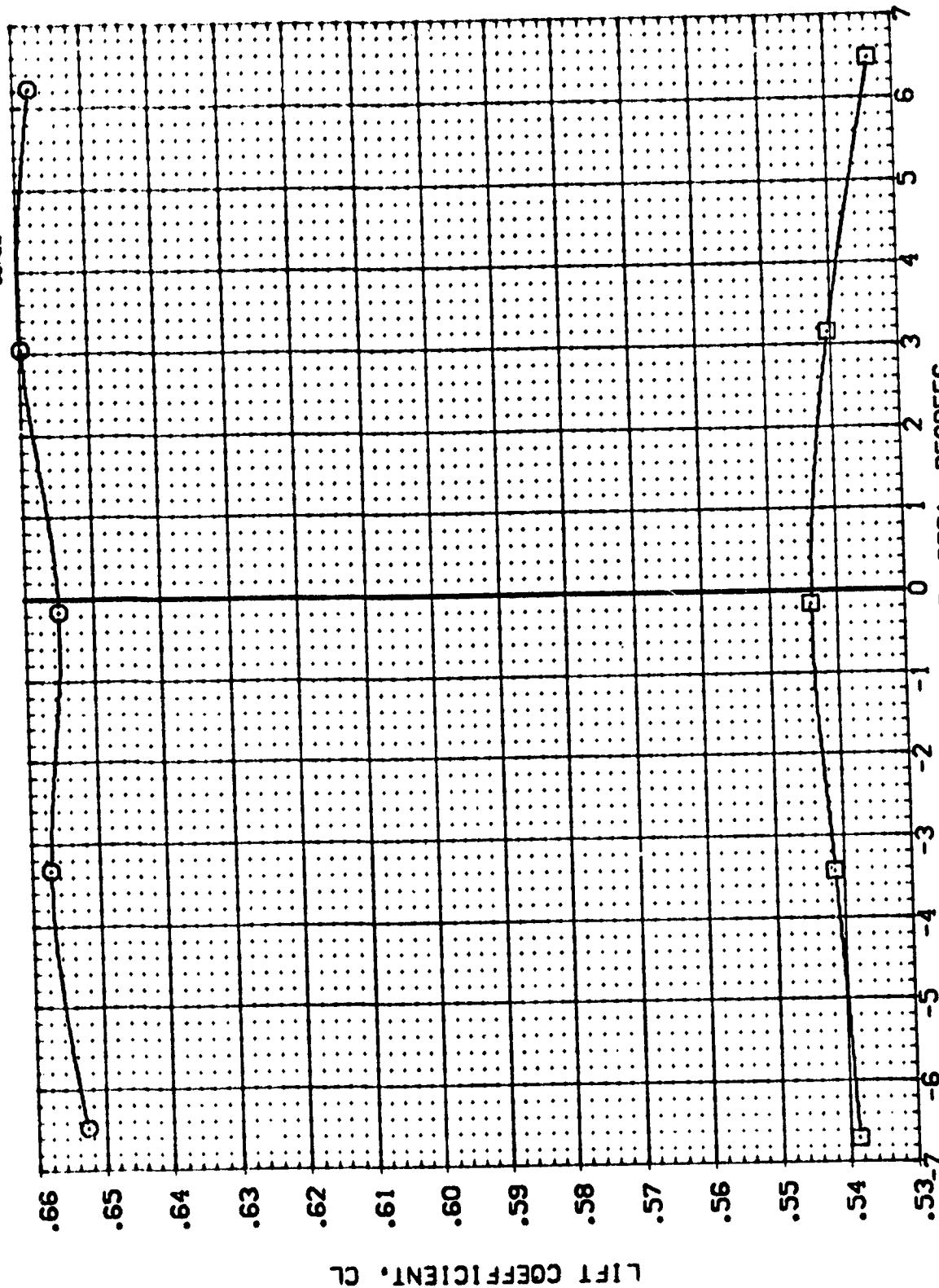


FIG.58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RBG010)

AVES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | | |
|--------|-------|-------------------|--------|--------|
| | | ALPHA | ELEVON | RUDDER |
| | 2.498 | 20.000 | 10.000 | |
| | 3.501 | .000 | 40.000 | |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| | SG.F.T. |
| SREF | 2.4210 |
| LREF | 38.8490 |
| BREF | 38.8490 |
| XREF | 32.3000 |
| YREF | .0000 |
| ZREF | .0000 |
| SCALE | .0000 |

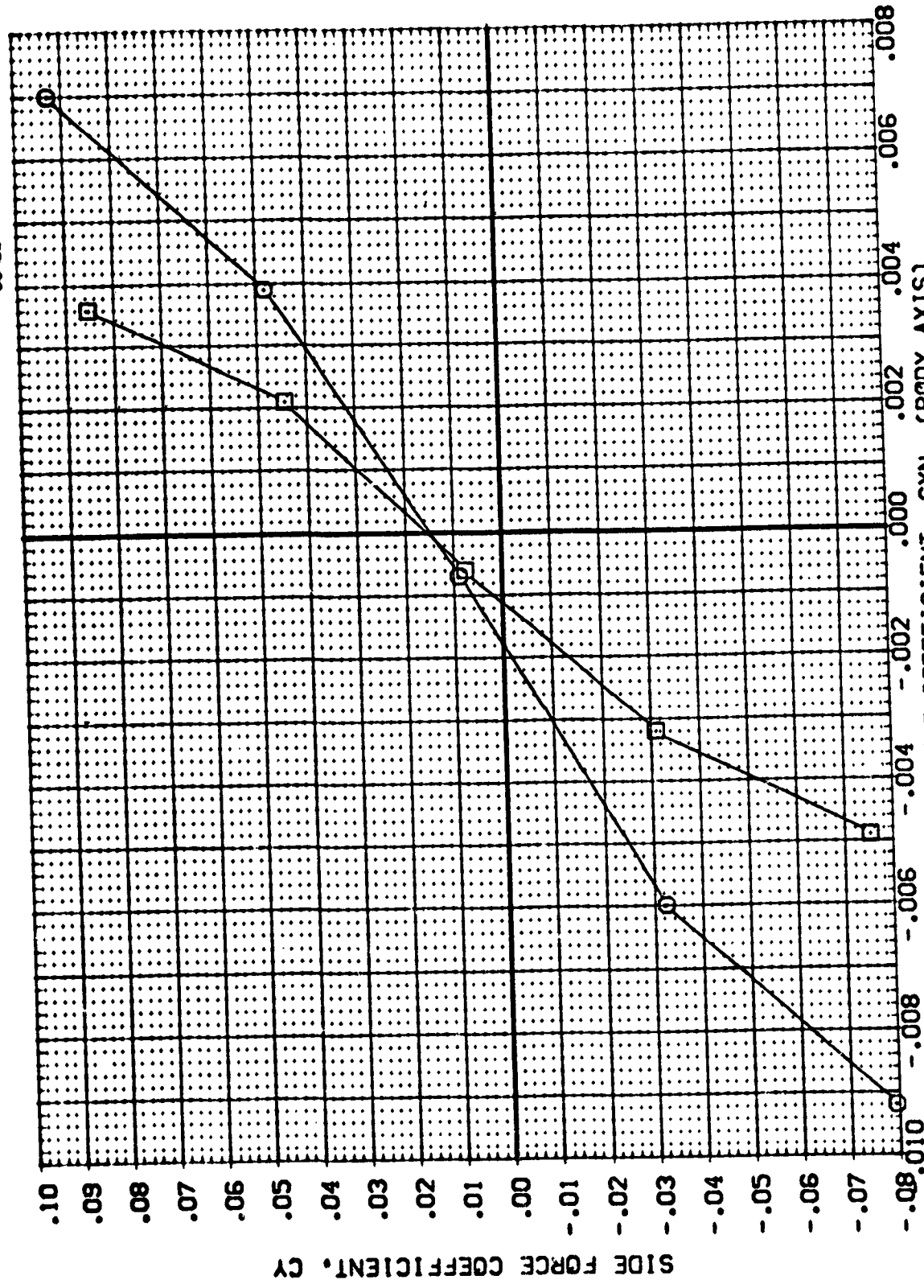


FIG.58 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RB0011)

AVES 87-707-CA12 02A

| SUB | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | RUDDER |
|-----|-------|-------|--------|-------------------|---------|--------|--------|
| | 2.498 | | | .000 | -20.000 | | |
| | 3.502 | | | .000 | 40.000 | | |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XARP 32.3000
YARP .0000
ZARP .0000
SCALE .0300

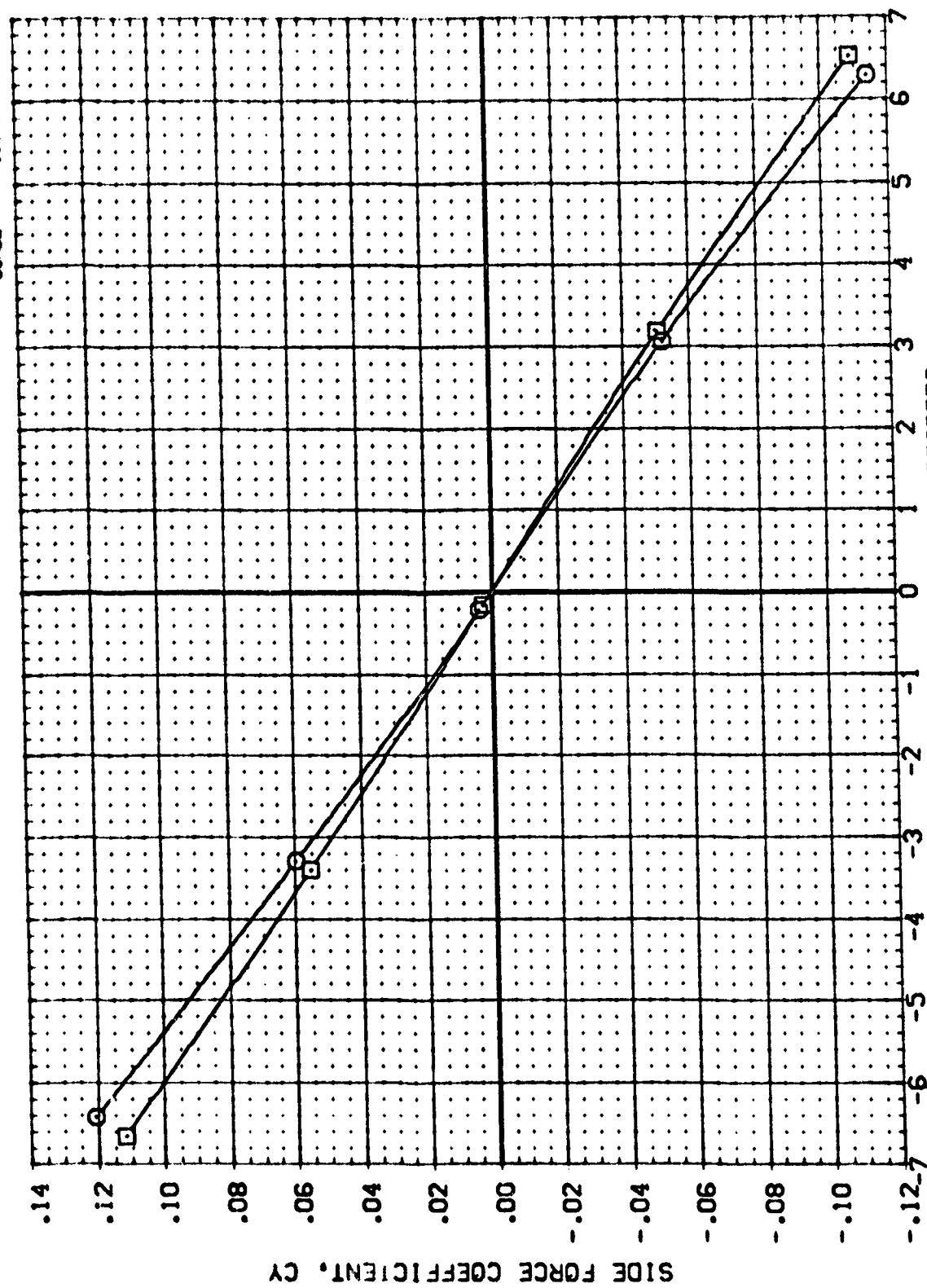


FIG.59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RBG011)

AMES 87-707-CA:2 02A

SYMBOL MACH ALPHA RUDDER
2.498 3.502
PARAMETRIC VALUES
.000 .000
ELEVON RUDDLR
-20.000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0000

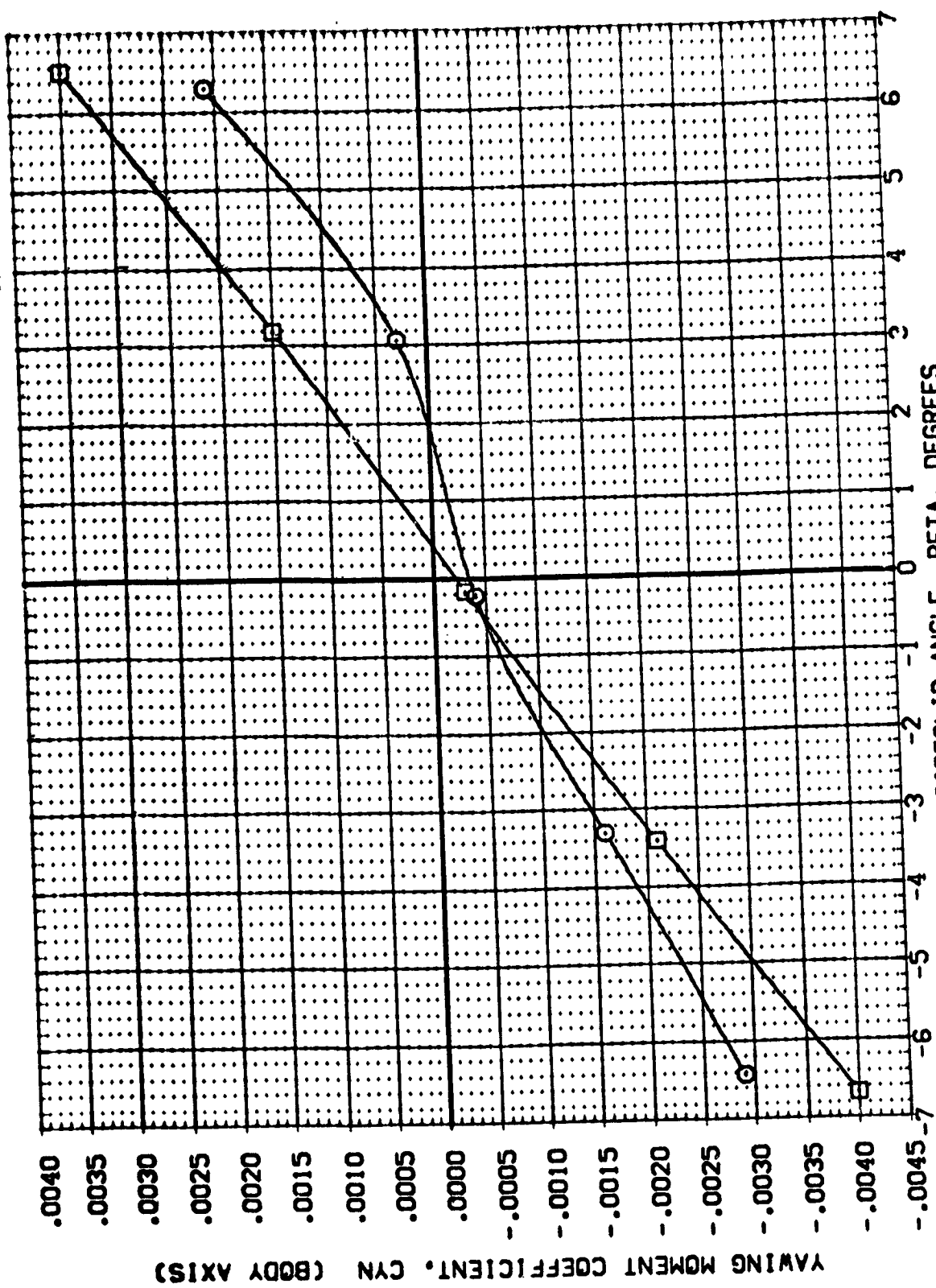


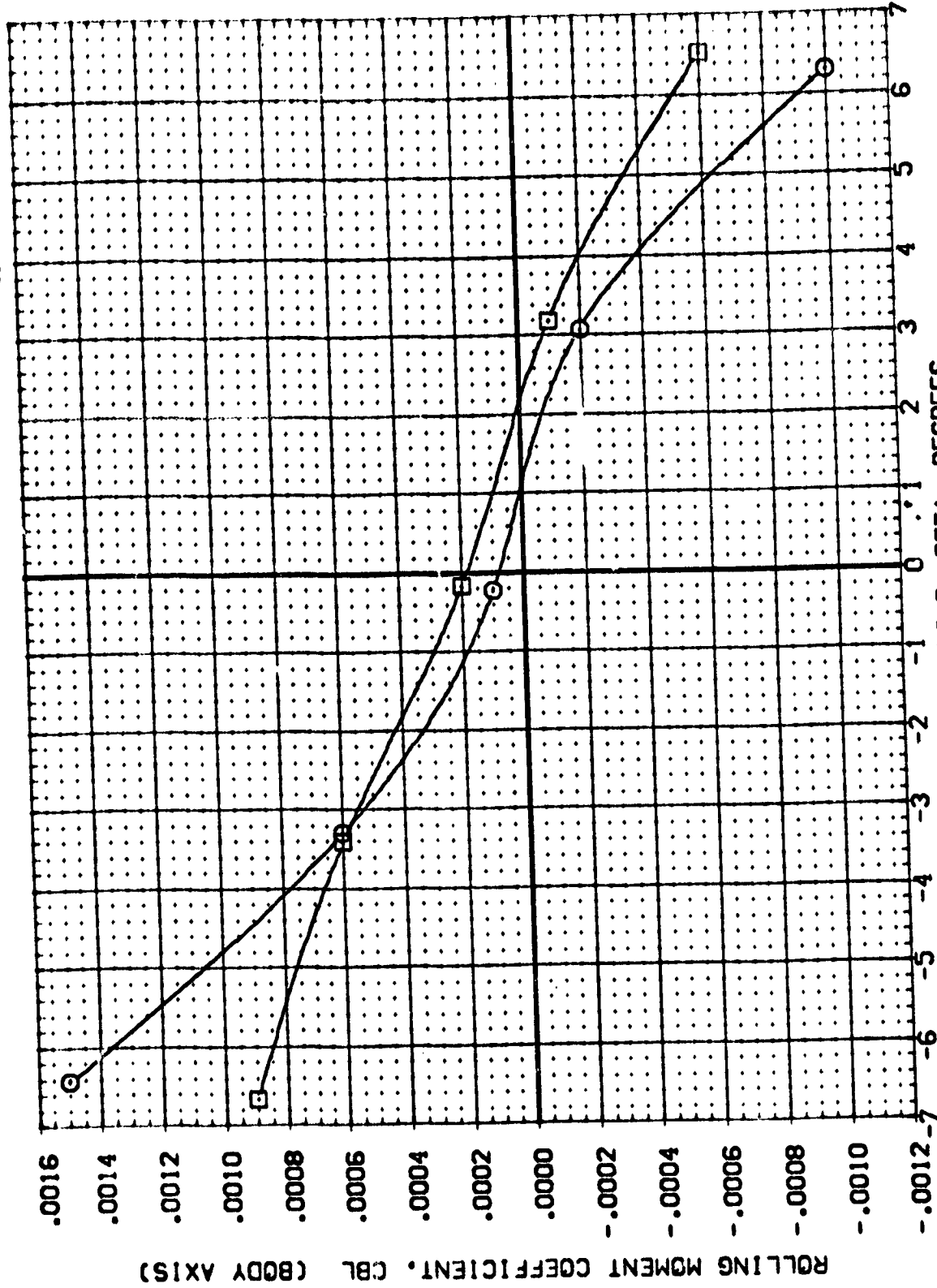
FIG.59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
PAGE 493

(R8G011)

AMES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | RUDDER |
| ○ | 2.498 | .000 | -20.000 |
| □ | 3.502 | .000 | 40.000 |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.849C
BREF 39.849C
YPRP 32.3000
ZPRP .0000
SCALE .0000
SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG. 59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20, ELEVON=20, MN=2.5, 3.5

(RB0011)

AMES 87-707-CA12 02A

SYMBOL MACH PARAMETRIC VALUES
□ 2.498 ALPHA .000 ELEVON -20.000
○ 3.502 RUDDER .000 ROLFLR 40.000

REFERENCE INFORMATION
SREF 2.421C
LREF 19.819C
BREF 19.819C
XPRP 32.300C
YPRP 32.300C
ZPRP 32.300C
SCALE .030C

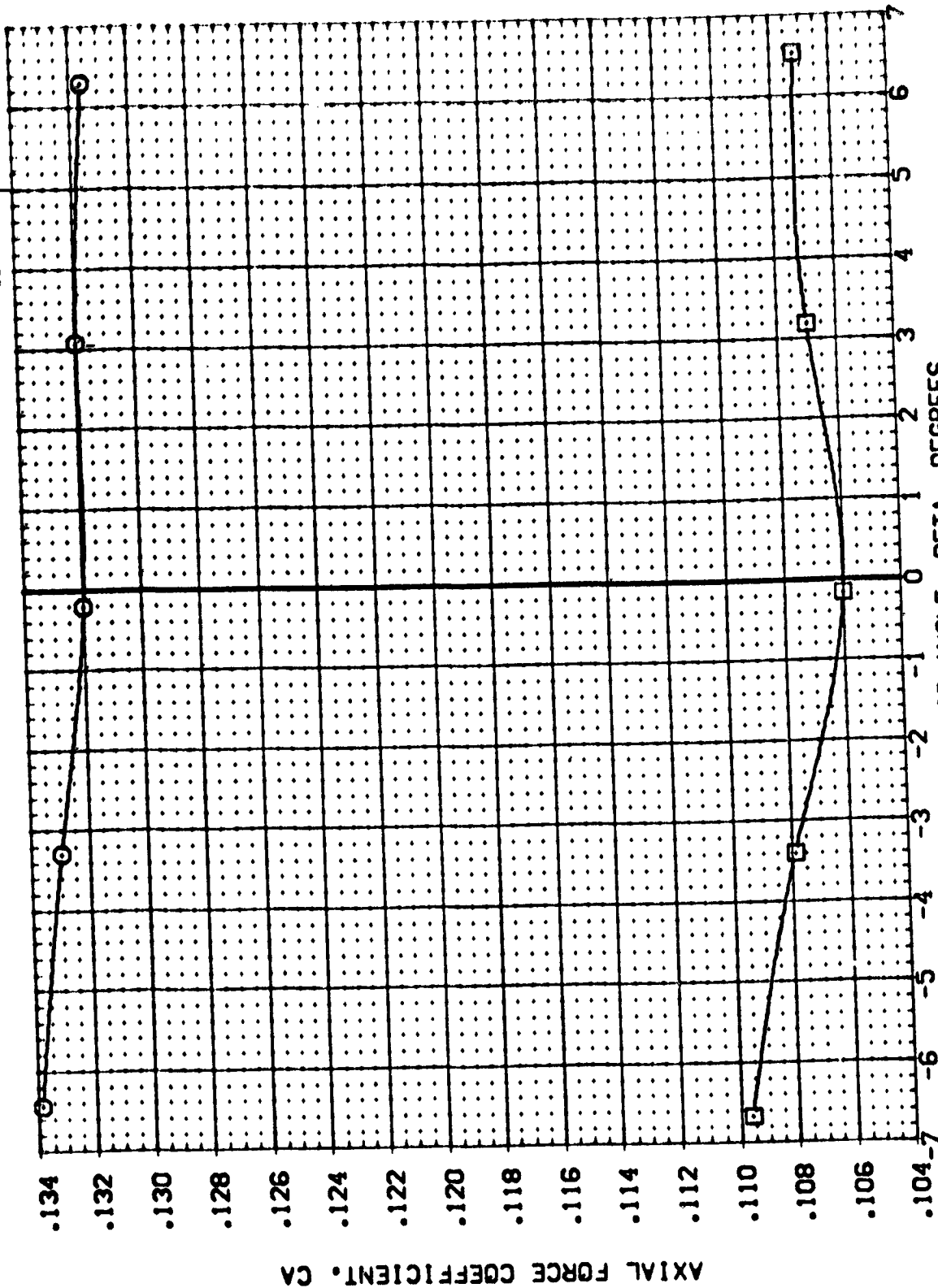


FIG.59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

[RBG011]

AVES 87-707-CA12 G2A

REFERENCE INFORMATION
 SREF 2.4212
 LREF 39.8450
 BREF 39.8450
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000

SYMBOL MACH ALPHA RUDDER
 2.438 3.502
 PARAMETRIC VALUES
 .000 .000 .000
 ELEVON RUDDER
 -20.000 40.000

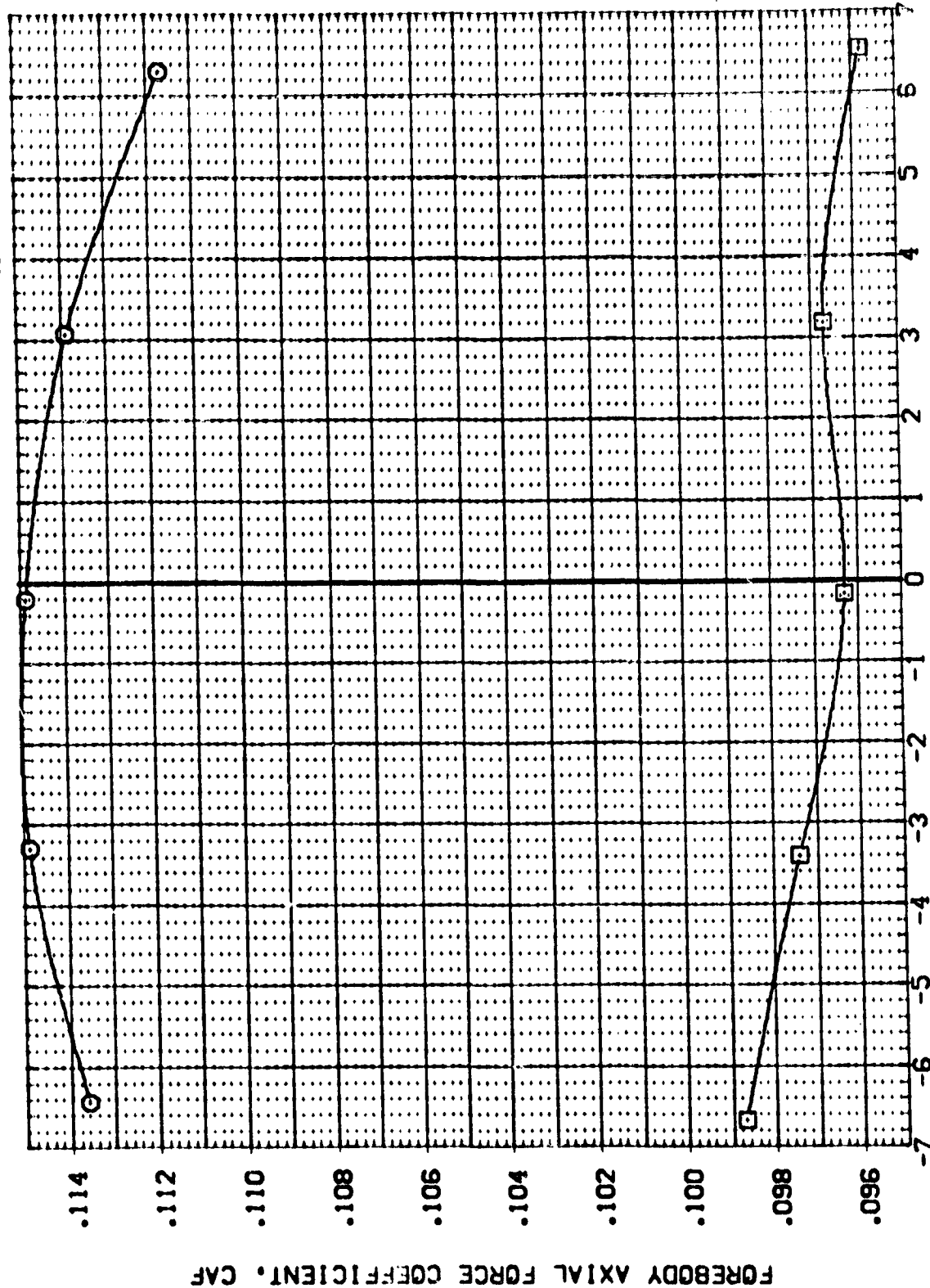


FIG.5.9 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20, MN=2.5, 3.5

(RBQ011)

REFERENCE INFORMATION
SREF 2.4215
LREF 78.8450
BREF 33.8450
YREF 30.3000
ZREF 1000.0000
SCALE

AVES 87-707-CA12 02A
SYMBOL MAC ALPHA RUDER
2.498 .000 .000
3.502 .000 .000
PARAMETRIC VALUES
ELEVON -20.000
RUDFLR 40.000

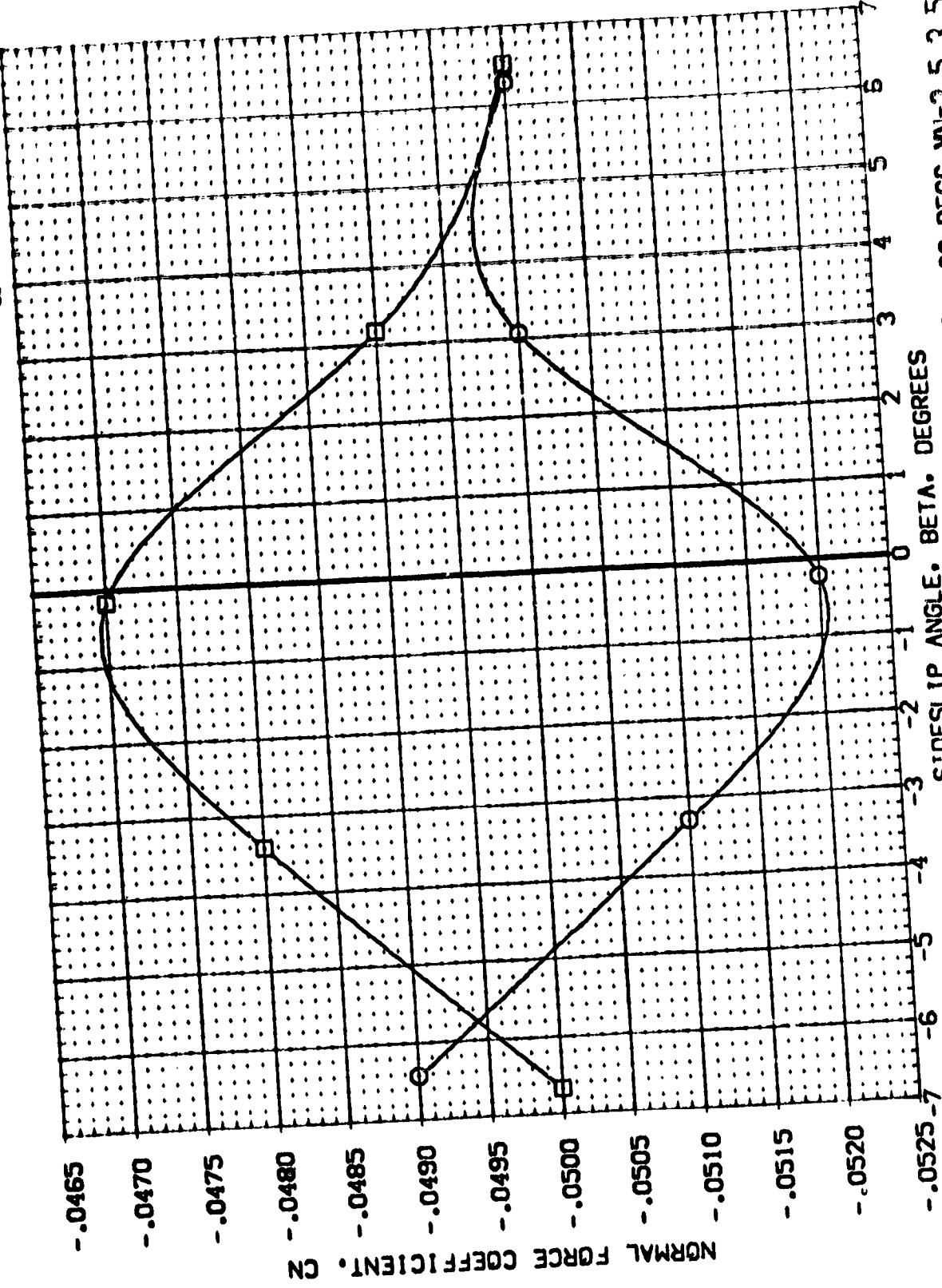


FIG.59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

AVES 87-707-3A:2

57-80 (1)

2.49
3.52

**ALPHA
RUBER**

RAJDER

PARAMETRIC VALUES

40.000
-25.000

五、

五、

五、

| | |
|-----|---------|
| SRE | 7-4213 |
| BRE | 39-BHSC |
| KPO | 39-BHSC |
| VPO | F-3000 |
| WFO | 7-1100 |
| STA | 7-1100 |

三

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44

44

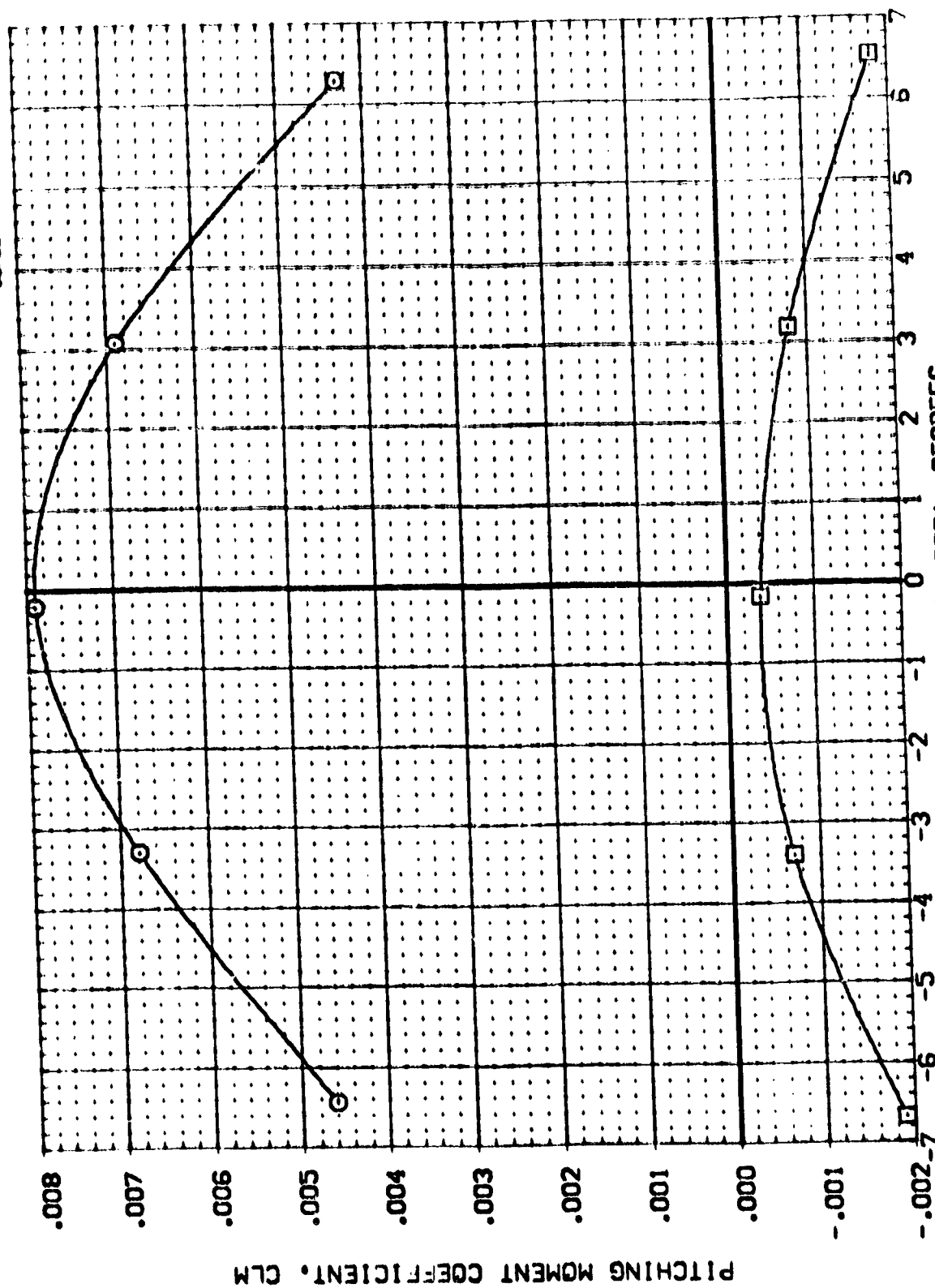
44

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44

44



SIDESLIP ANGLE. BETA. DEGREES

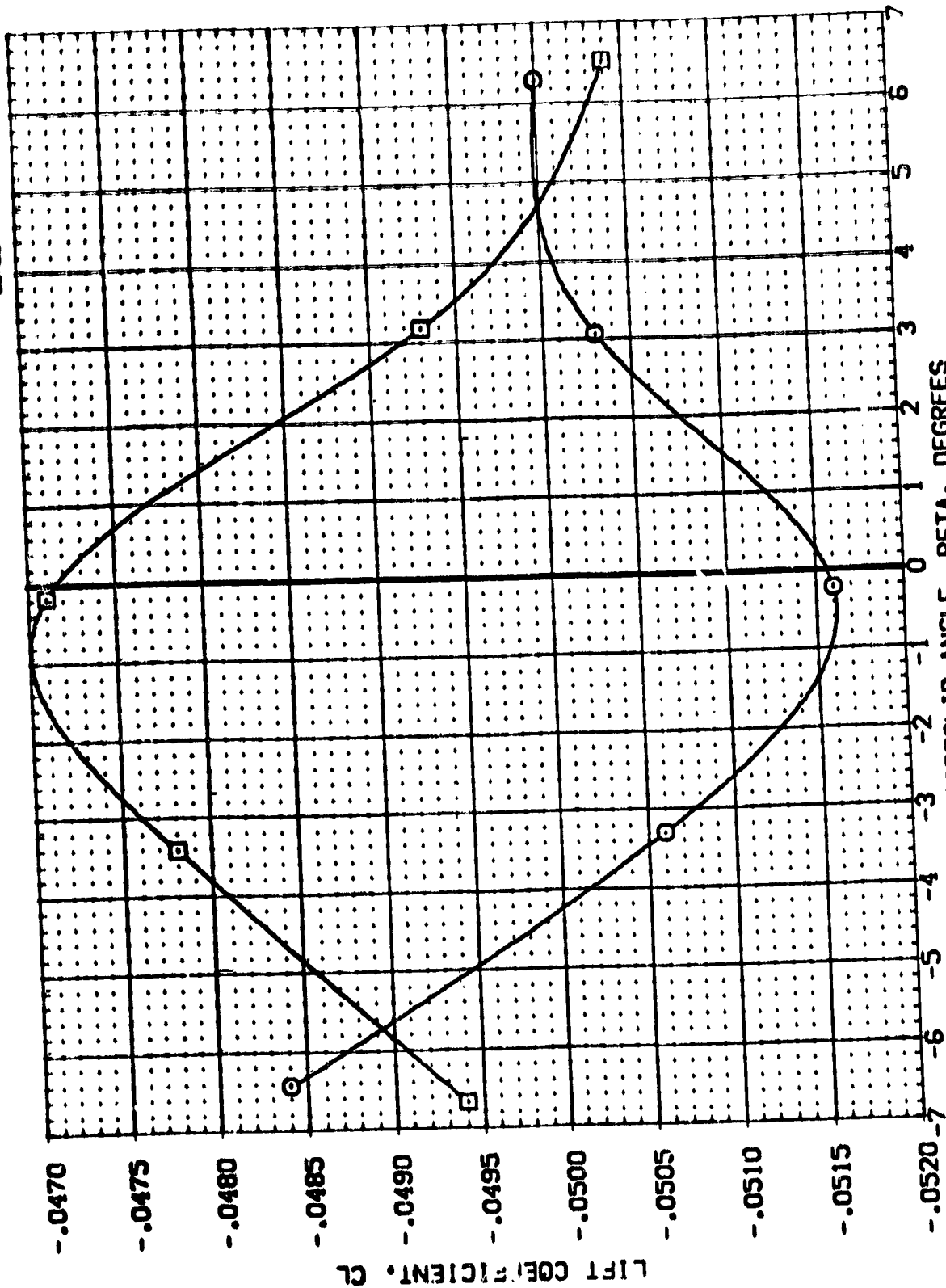
FIG. 59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, VN=2.5, 3.5
SIDESLIP ANGLE, BETA, DEGREES

(R20011)

AVES 87-707-0A12 Q2A

| SYMBOL | WACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | ELEVON |
| □ | 2.498 | .000 | -20.000 |
| ○ | 3.502 | .000 | 40.000 |

REFERENCE INFORMATION
 SREF 2.4212
 LREF 25.8450
 BREF 25.8450
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0000



SIDELIP ANGLE, BETA, DEGREES

FIG.59 ORBITER LAT-OIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RB0011)

AMES 87-707-3A12 02A

| | | | | | | | |
|--------|-------|-------|--------|-------------------|--------|---------|--------|
| SYMBOL | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | -20.000 | 40.000 |
| 110 | 2.498 | 3.502 | | .000 | .000 | | |

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

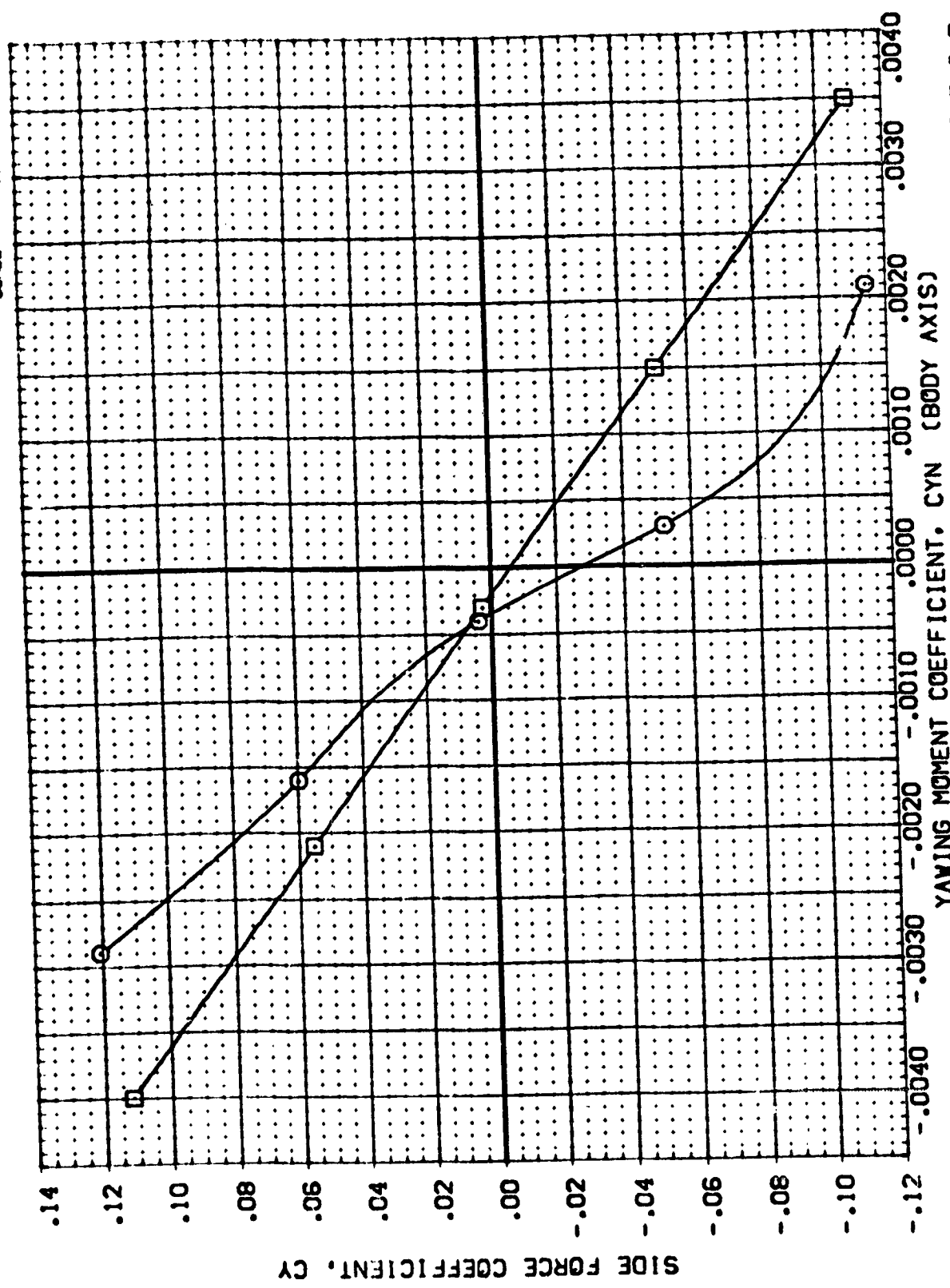


FIG.59 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
PAGE 500

(R80012)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON -20.000 40.000
 2.498 3.502

REFERENCE INFORMATION
 SREF 2.4210
 LREF 38.8490
 BREF 39.8490
 XMRP 32.0000
 YMRP 0.0000
 ZMRP 0.0000
 SCALE 0.0000

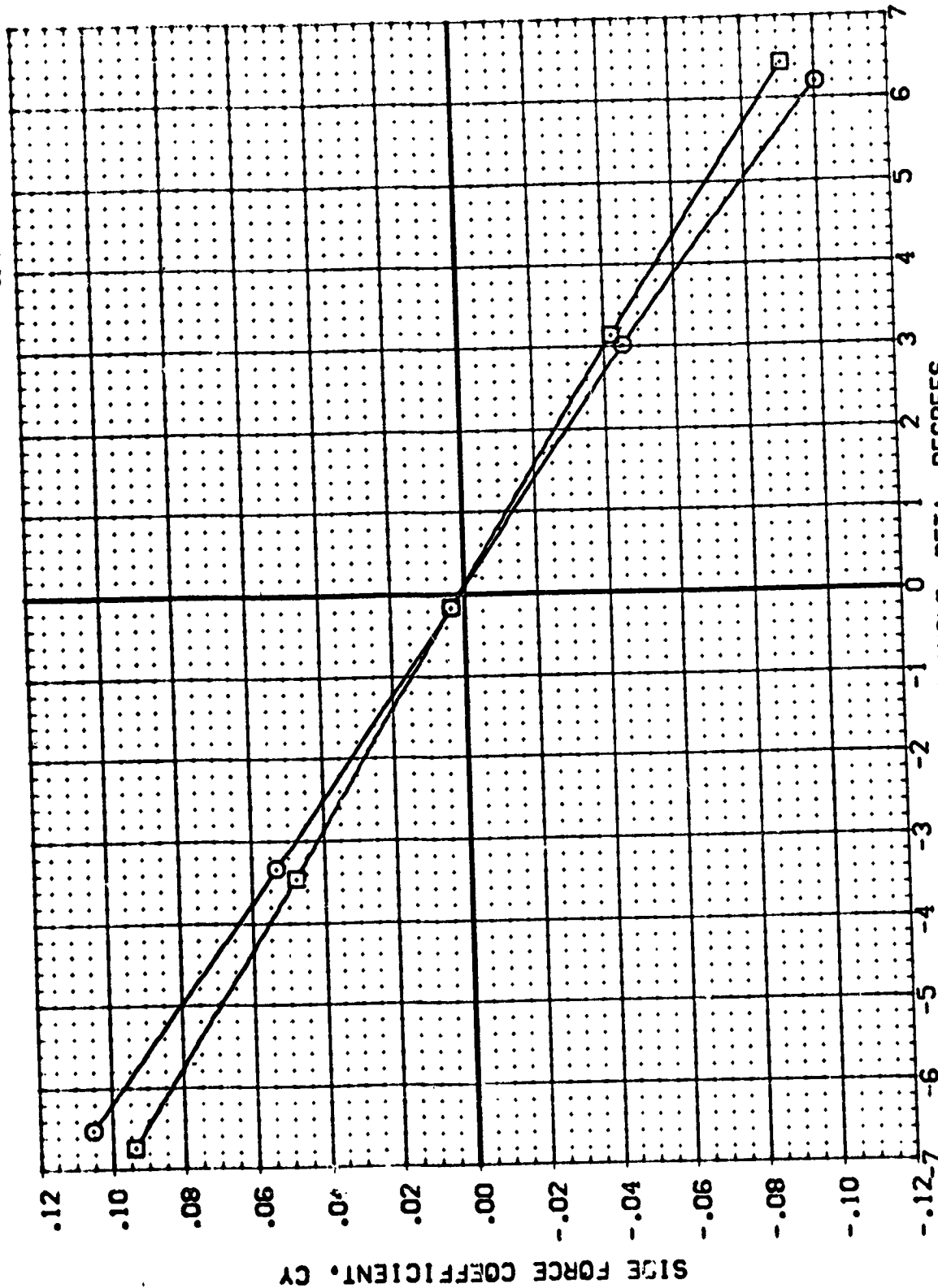


FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 50

AVES 87-7C7-CA:2

108-10

WACH
2.498
3.502

ALPHA
R. JOER

| PARAMETRIC VALUES | |
|-------------------|---------|
| 10.000 | ELEVEN |
| .000 | ROJLR |
| | -20.000 |
| | 40.000 |

40.000
-20.000

40.000
-20.000

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRD | 37.3000 |
| YPRD | .0000 |
| ZPRD | .0000 |
| SCALE | .0300 |

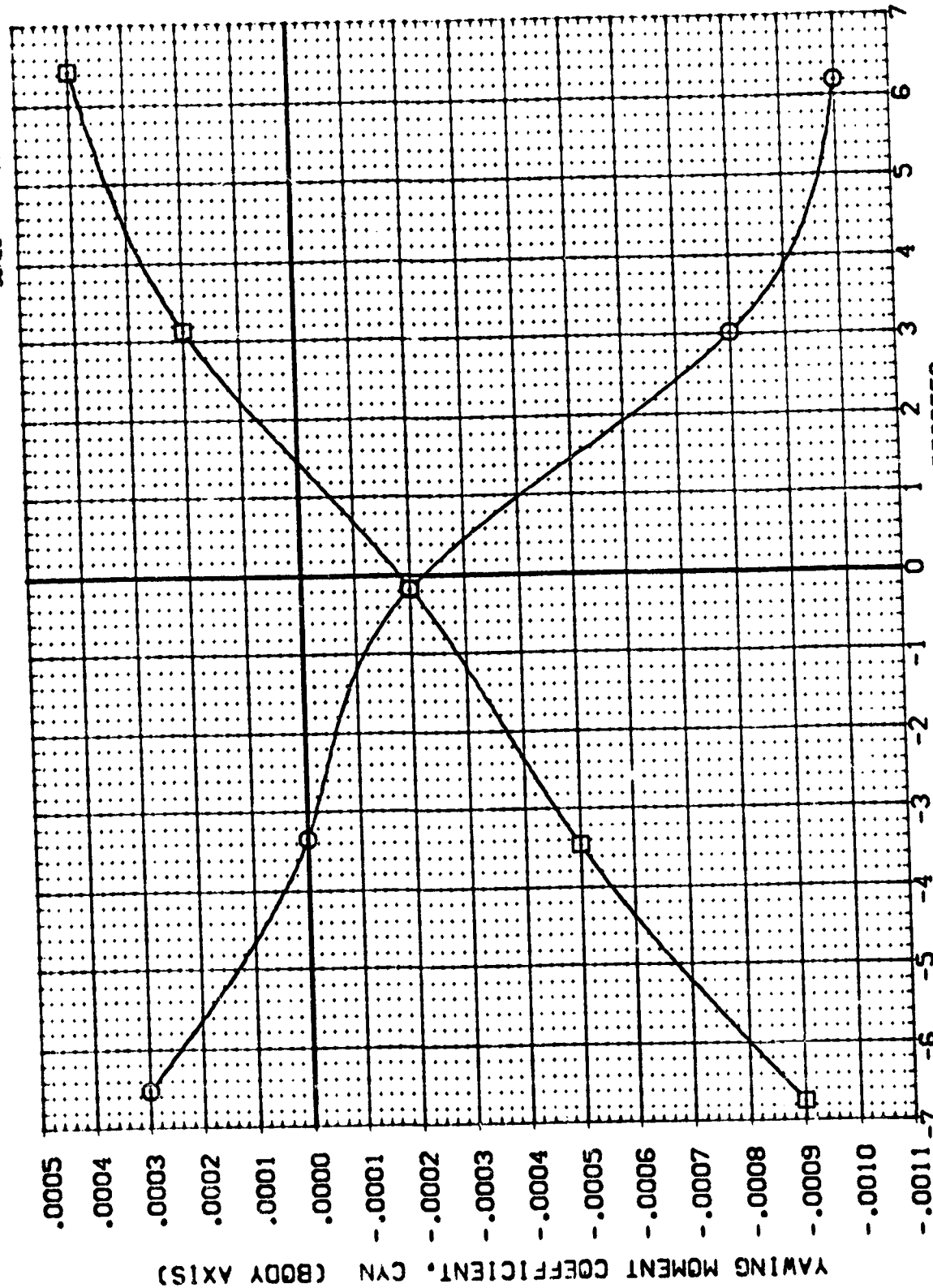


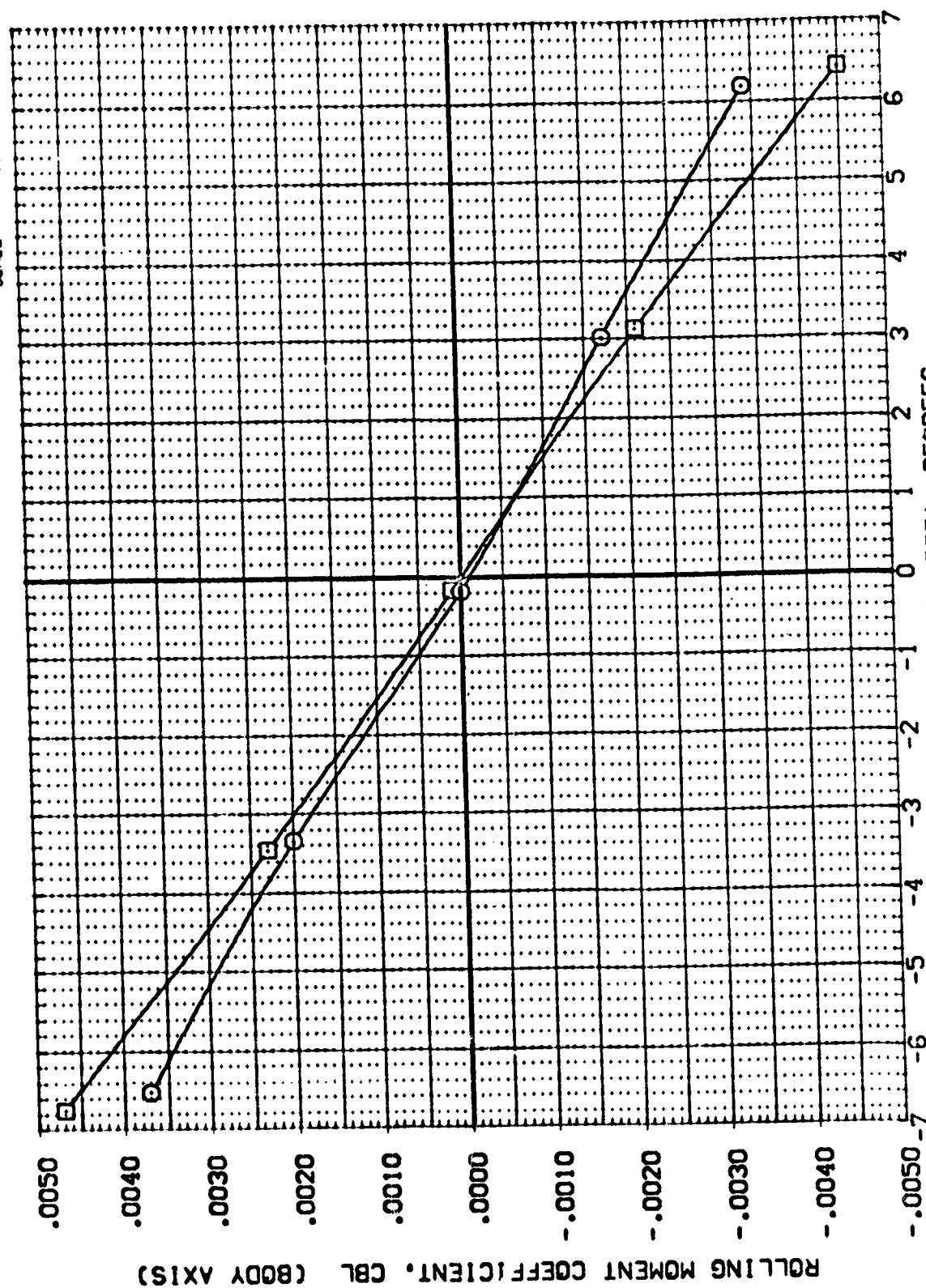
FIG. 60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RBQ012)

AVES 87-707-0A12 02A

| SYMBOL | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | -20.000 | 40.000 |
|--------|-------|--------|--------|-------------------|--------|---------|--------|
| □ | 2.498 | 10.000 | .000 | ROFLR | | | |
| ○ | 3.502 | | | | | | |

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0300



SIDESLIP ANGLE. BETA. DEGREES

FIG. 60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20, DEGS, MN=2.5, 3.5

(RB0012)

AVES 87-707-CA:2 C2A

SYMBOL WIND ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER
2.498 3.502 10.000 .000 -20.000 10.000

REFERENCE INFORMATION
SREF 2.4210 SC.FT.
LREF 39.8490
BREF 39.8490
XGRP 32.3000
YGRP .0000
ZGRP .0000
SCALE .0300

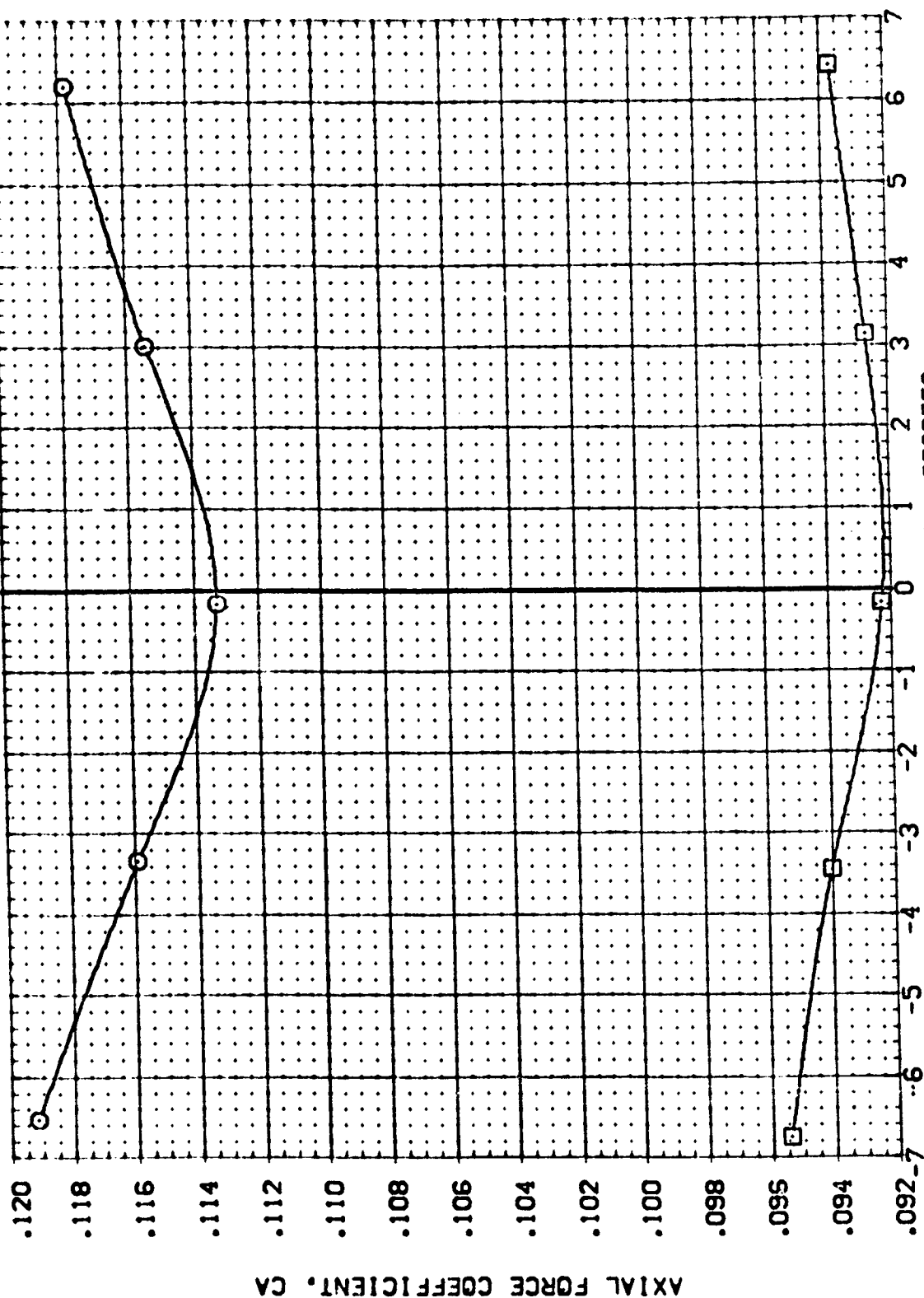


FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RBG012)

AMES 87-707-CA12 C2A

SYMBOL MACH ALPHA RUDDER
2.498 10.000 ELEVON -20.000
3.502 .000 RUDFLR 40.000

REFERENCE INFORMATION
SPREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

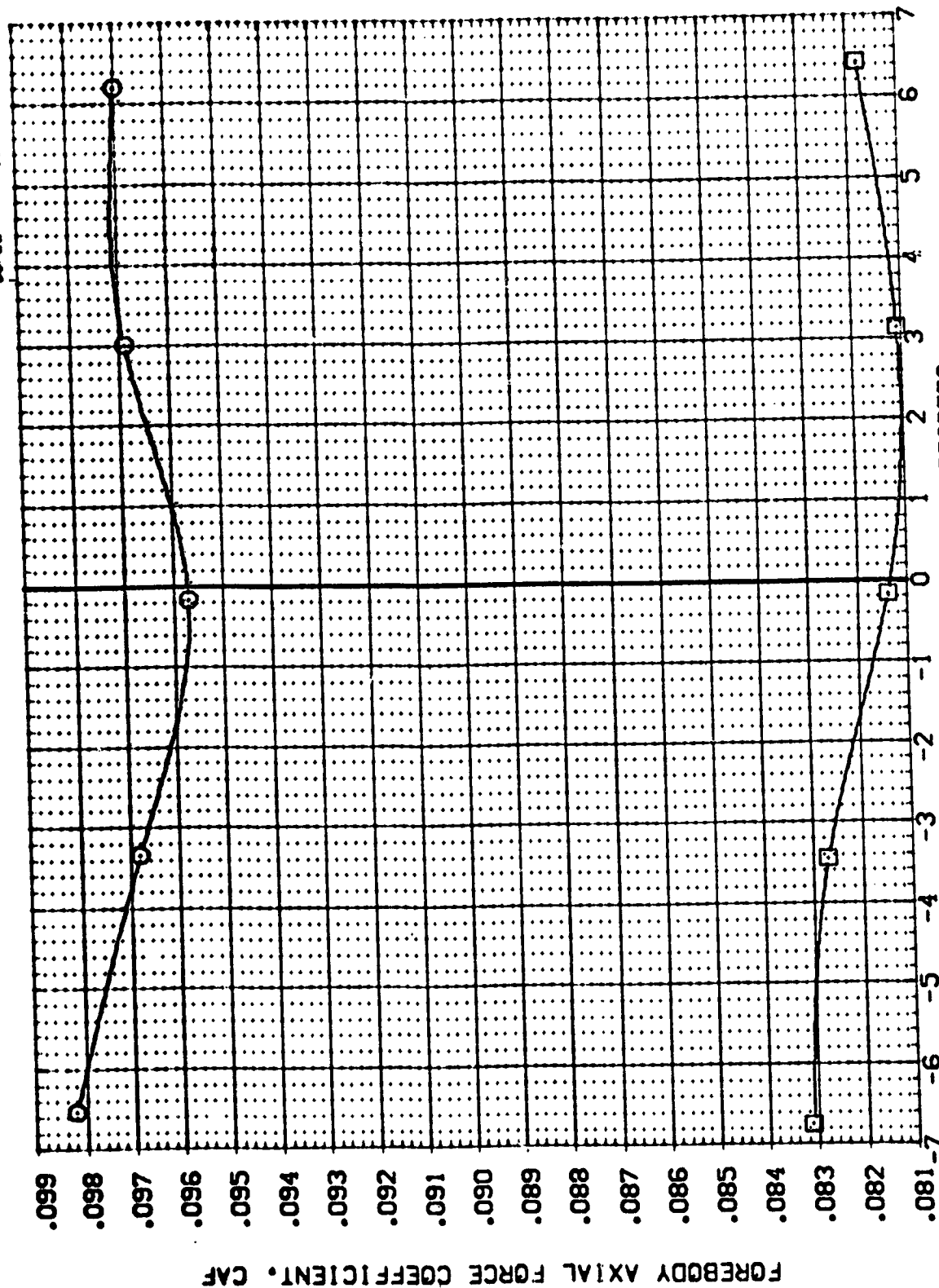


FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

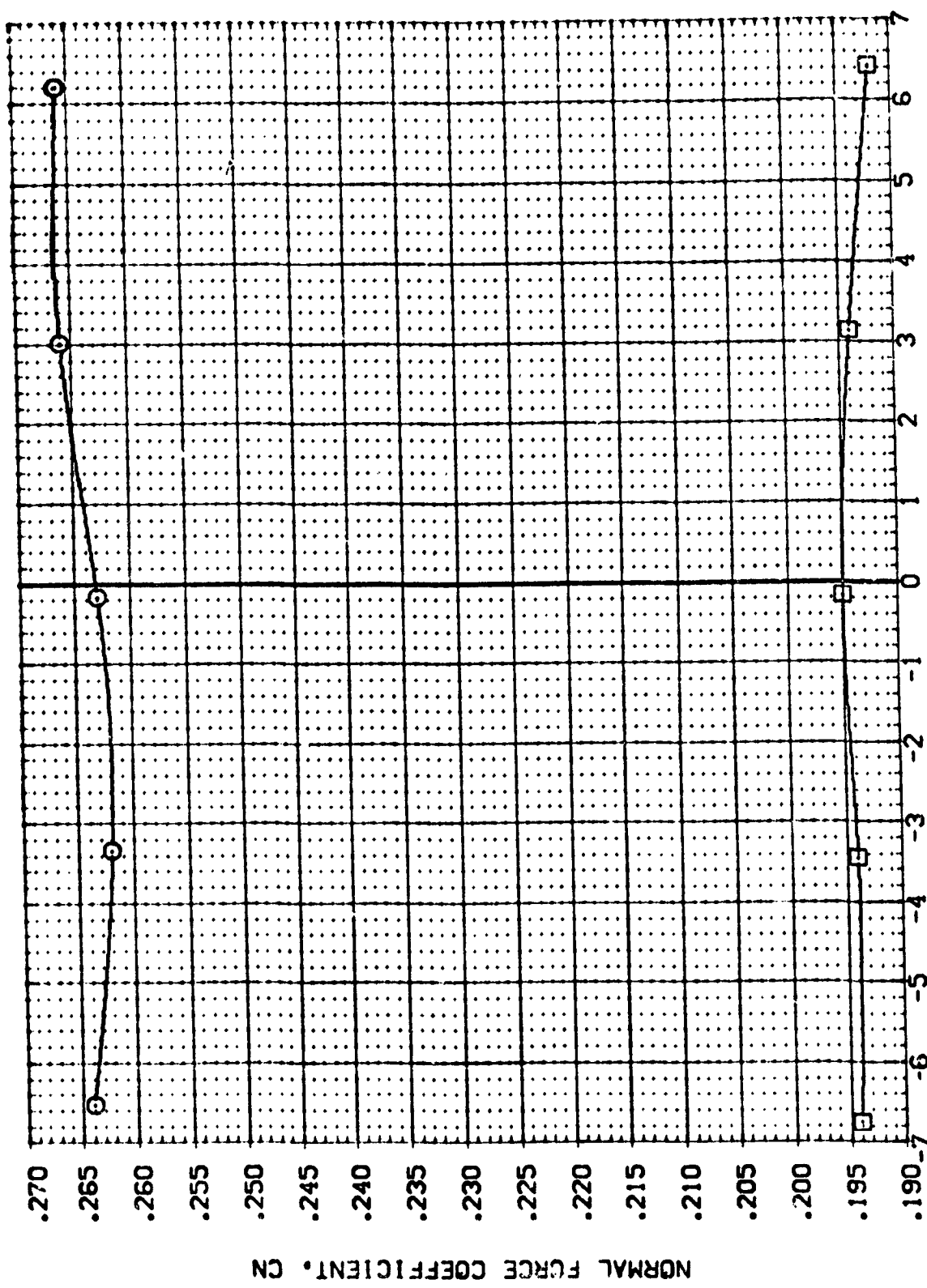
(R80012)

AVES 87-707-CA:2 C2A

| PARAMETRIC VALUES | |
|-------------------|---------|
| WAC | 2.498 |
| ALPHA | 10.000 |
| RUDDER | 10.000 |
| ELEVON | -20.000 |
| RUDDER | 10.000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| SREF | 2.4710 |
| LREF | 30.8490 |
| BREF | 30.8490 |
| XWRD | 32.3000 |
| YWRD | 1.0000 |
| ZWRD | 1.0000 |
| SCALE | 0.000 |



SIDESLIP ANGLE, BETA, DEGREES

FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20, MN=2.5, 3.5

PAGE 506

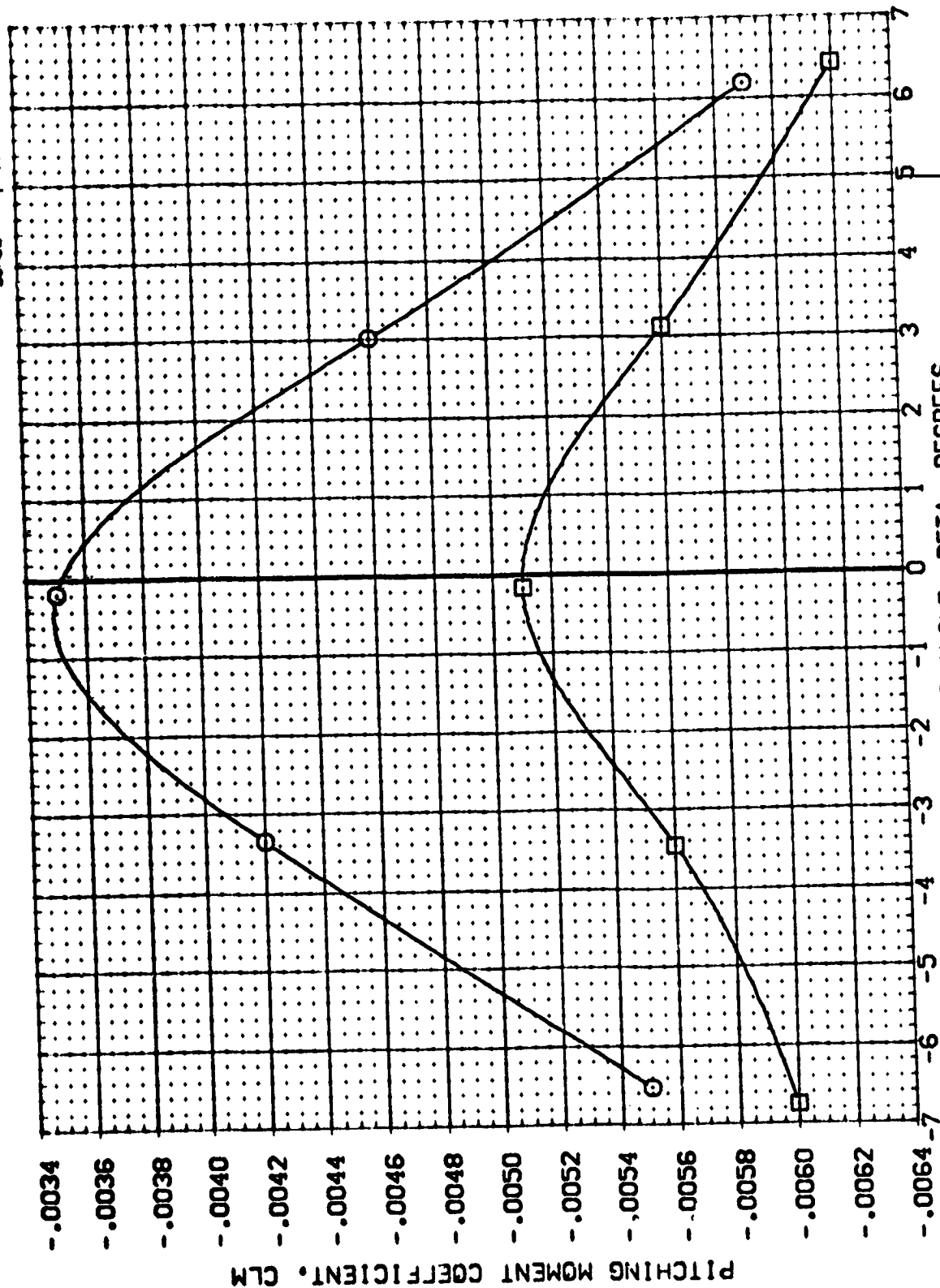
(R80012)

AMES 87-707-CA12 02A

| SYMBOL | WACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUOFLR | -20.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|--------|---------|--------|
| 10 | 2.498 | | | | | | | |
| | 3.502 | | | | | | | |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.4210 | SCALE |
| LREF | 39.8490 | |
| BREF | 39.8490 | |
| XMRD | 32.3000 | |
| YMRD | .0000 | |
| ZMRD | .0000 | |
| SCALE | .0300 | |



SIDESLIP ANGLE, BETA, DEGREES

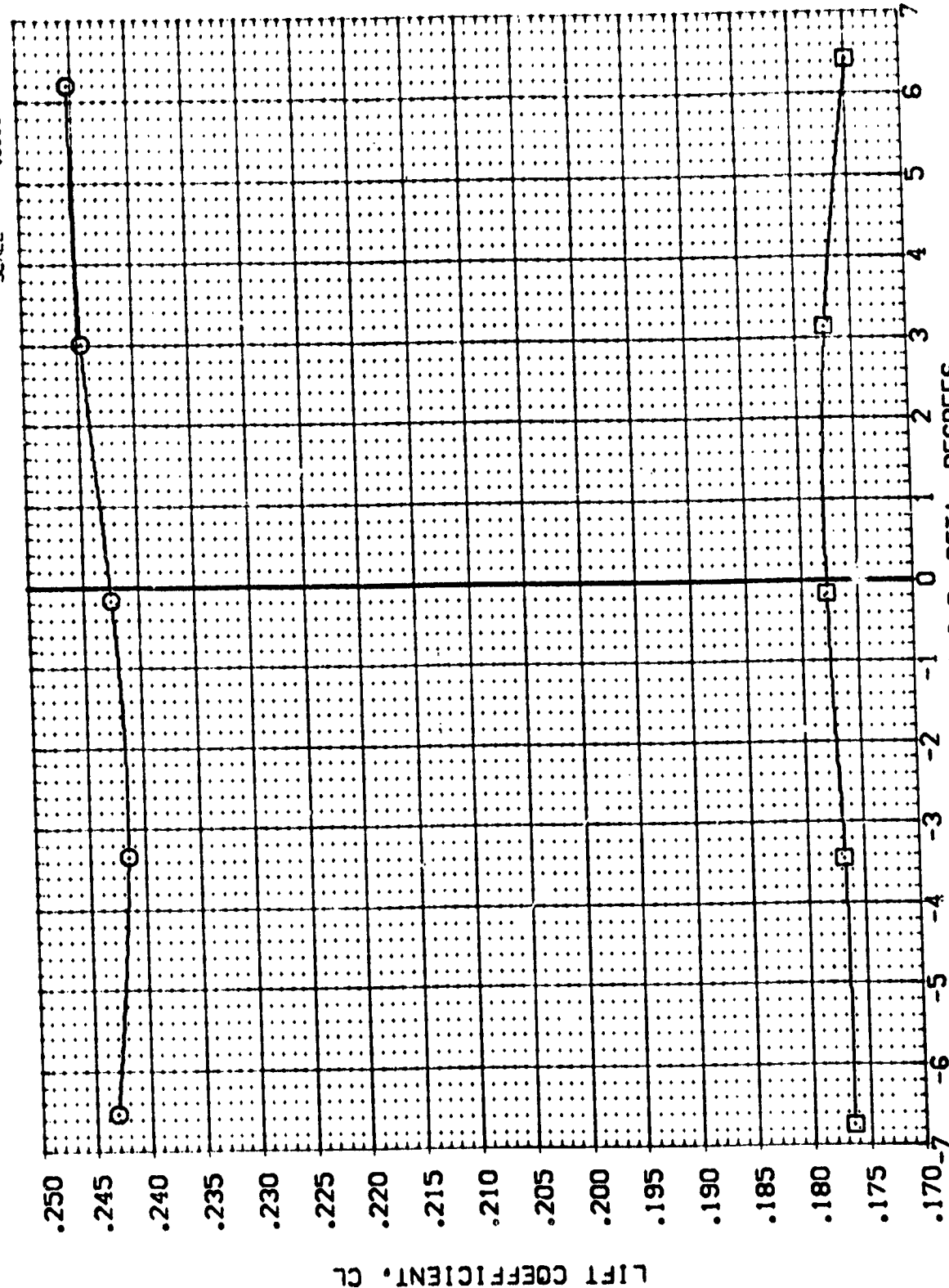
FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20, MN=2.5, 3.5

(R80012)

AVES 87-707-CA:2 02A

SYMBOL WAC-2.498 ALPHA 10.000 ELEVON -20.000
100 3.502 RUDDER .000 RUOFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XMRD 37.3000
YMRD .0000
ZMRD .0000
SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

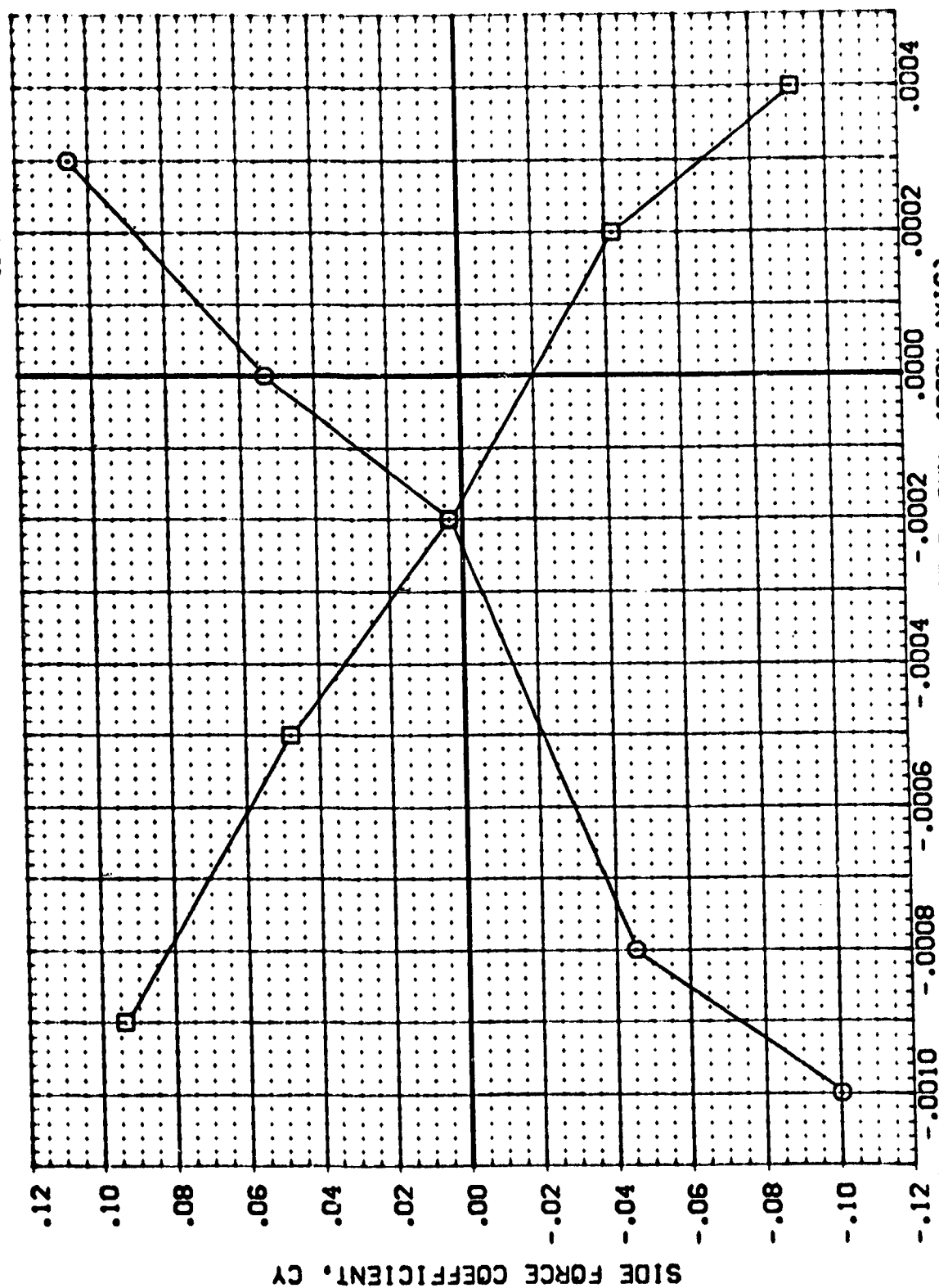
FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
PAGE 508

(RBG012)

AMES 87-707-CA12 C2A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON R.O.F.L.R. -20.000 40.000

REFERENCE INFORMATION
SREF 2.4213
LREF 39.8450
BREF 39.8450
XREF 32.3000
YREF 0.0000
ZREF 0.0000
SCALE 0.0000



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

FIG.60 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

AVES 87-707-CA:2 32A

OL

MAC-
2.49
3.52

ADAM
DUBER

PARAMETER:
20.000
.000

-20.000
40.000

| | |
|-------------------|--------|
| PARAMETRIC VALUES | |
| 20.000 | ELEVON |
| .000 | RJOFER |

| SCALE | REFERENCE | COINTEGRATION |
|-------|-----------|---------------|
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 25 | 25 | 25 |
| 26 | 26 | 26 |
| 27 | 27 | 27 |
| 28 | 28 | 28 |
| 29 | 29 | 29 |
| 30 | 30 | 30 |
| 31 | 31 | 31 |
| 32 | 32 | 32 |
| 33 | 33 | 33 |
| 34 | 34 | 34 |
| 35 | 35 | 35 |
| 36 | 36 | 36 |
| 37 | 37 | 37 |
| 38 | 38 | 38 |
| 39 | 39 | 39 |
| 40 | 40 | 40 |
| 41 | 41 | 41 |
| 42 | 42 | 42 |
| 43 | 43 | 43 |
| 44 | 44 | 44 |
| 45 | 45 | 45 |
| 46 | 46 | 46 |
| 47 | 47 | 47 |
| 48 | 48 | 48 |
| 49 | 49 | 49 |
| 50 | 50 | 50 |
| 51 | 51 | 51 |
| 52 | 52 | 52 |
| 53 | 53 | 53 |
| 54 | 54 | 54 |
| 55 | 55 | 55 |
| 56 | 56 | 56 |
| 57 | 57 | 57 |
| 58 | 58 | 58 |
| 59 | 59 | 59 |
| 60 | 60 | 60 |
| 61 | 61 | 61 |
| 62 | 62 | 62 |
| 63 | 63 | 63 |
| 64 | 64 | 64 |
| 65 | 65 | 65 |
| 66 | 66 | 66 |
| 67 | 67 | 67 |
| 68 | 68 | 68 |
| 69 | 69 | 69 |
| 70 | 70 | 70 |
| 71 | 71 | 71 |
| 72 | 72 | 72 |
| 73 | 73 | 73 |
| 74 | 74 | 74 |
| 75 | 75 | 75 |
| 76 | 76 | 76 |
| 77 | 77 | 77 |
| 78 | 78 | 78 |
| 79 | 79 | 79 |
| 80 | 80 | 80 |
| 81 | 81 | 81 |
| 82 | 82 | 82 |
| 83 | 83 | 83 |
| 84 | 84 | 84 |
| 85 | 85 | 85 |
| 86 | 86 | 86 |
| 87 | 87 | 87 |
| 88 | 88 | 88 |
| 89 | 89 | 89 |
| 90 | 90 | 90 |
| 91 | 91 | 91 |
| 92 | 92 | 92 |
| 93 | 93 | 93 |
| 94 | 94 | 94 |
| 95 | 95 | 95 |
| 96 | 96 | 96 |
| 97 | 97 | 97 |
| 98 | 98 | 98 |
| 99 | 99 | 99 |
| 100 | 100 | 100 |

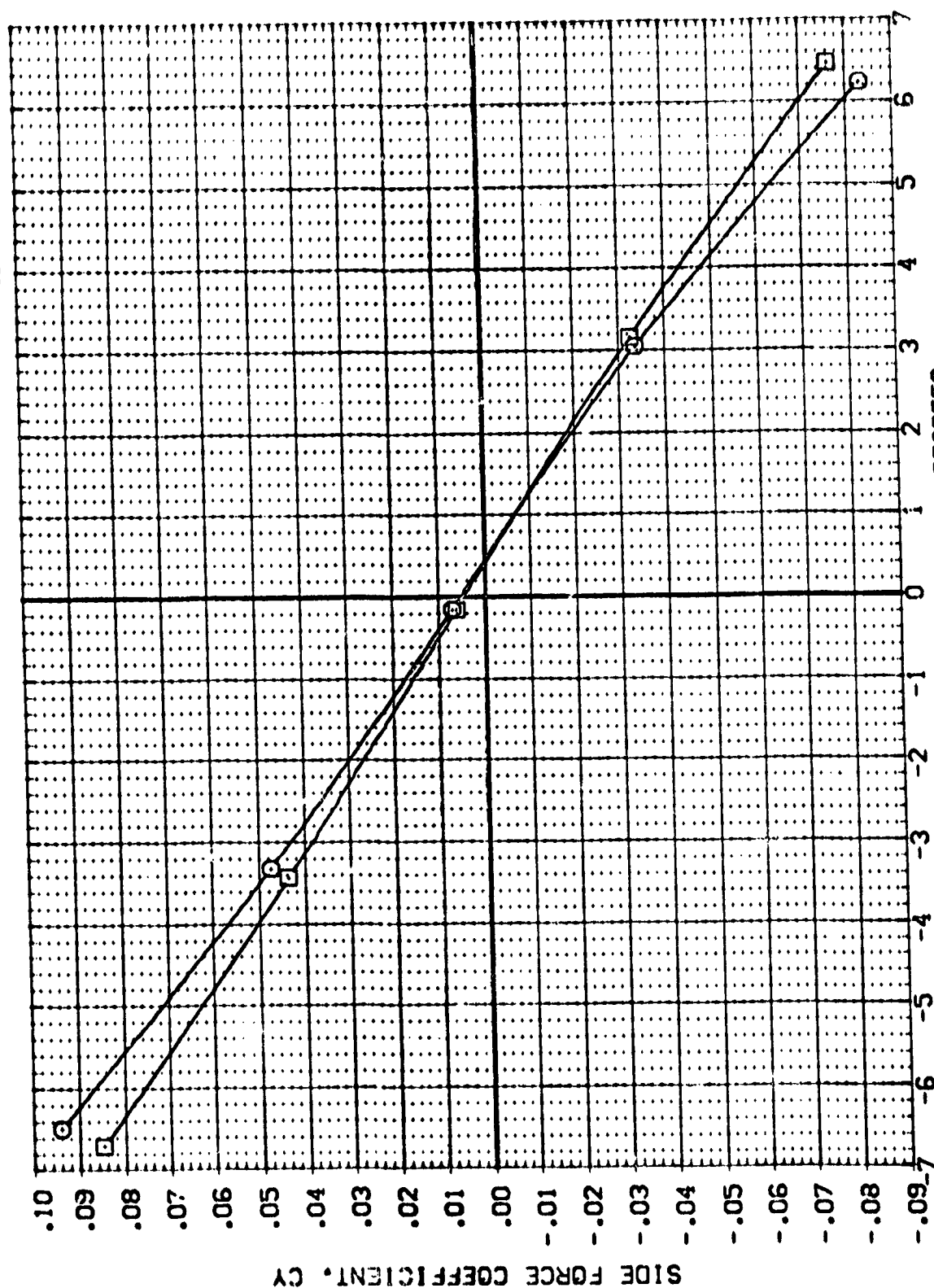


FIG. 61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, $\gamma_N=2.5$, 3.5

AMES 87-707-BA:2 C2A

| Sym | WACH | ALPHA | RHO | PARAMETRIC VALUES |
|-----|-------|--------|--------|-------------------|
| 00 | 2.498 | 20.000 | ELEVON | -20.000 |
| 01 | 3.502 | .000 | R/D EL | 40.000 |

| | |
|-------------|---------|
| SPEC | 2 42:3 |
| REF | 39 84:5 |
| BRE | 39 84:6 |
| XERO | 32 |
| XERO | XXXXXX |
| XERO | XXXXXX |
| SCALE | XXXXXX |
| SCALE | XXXXXX |
| INFORMATION | XXXXXX |

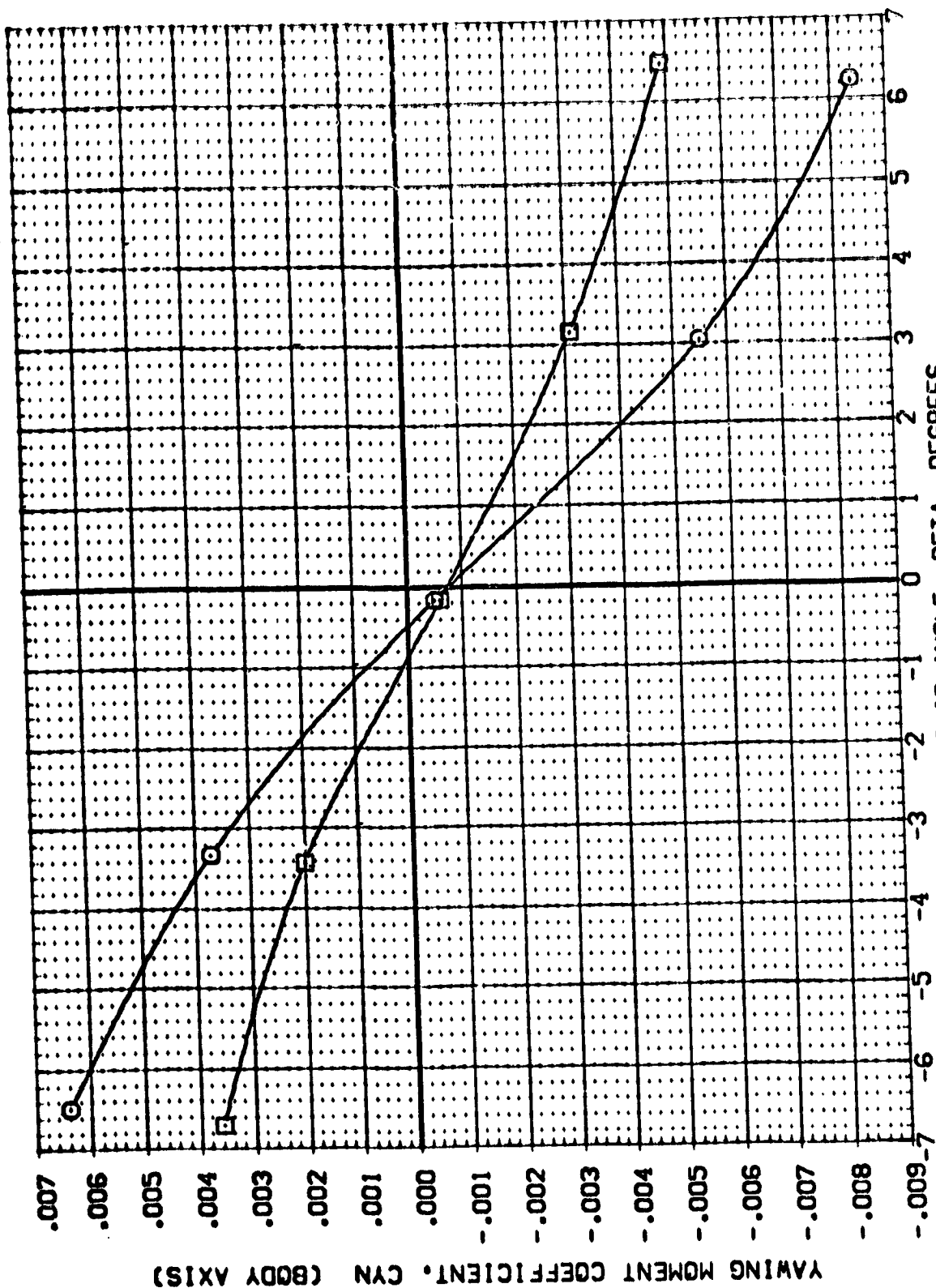


FIG. 61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

AVES 87-707-CA:2 C2A

| SYMBOL | WAG- | ALPHA | ROOFER | PIRAMETRIC VALUES |
|--------|------|-------|--------|-------------------|
| 2.498 | | | | 20.000 ELEVEN |
| 3.522 | | | | .000 ROOFER |
| | | | | -20.000 |
| | | | | 40.000 |

11/11/11 11:11:11

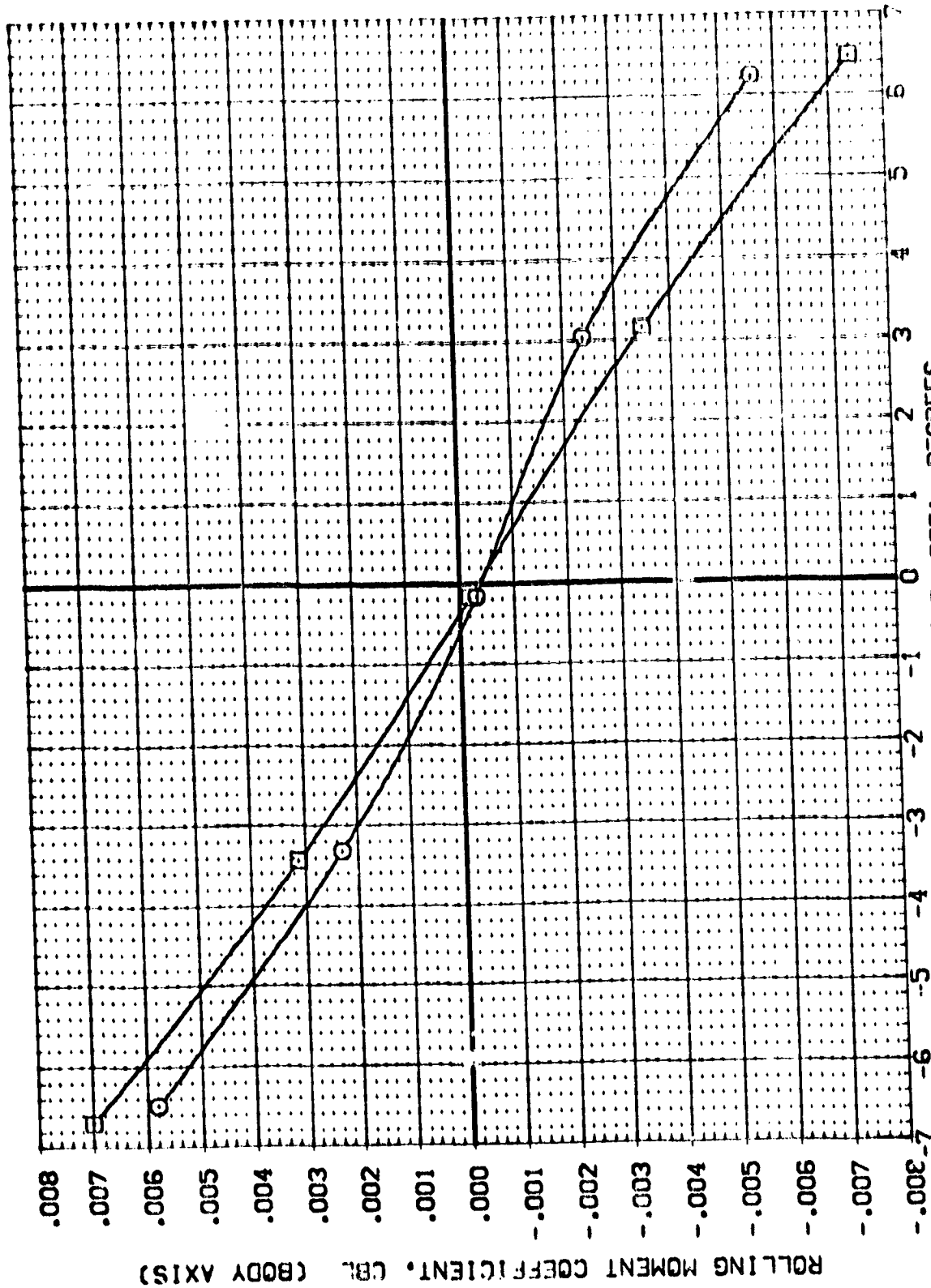


FIG. 61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEG, $\alpha=2.5, 3.5$
SIDESLIP ANGLE, BETA, DEGREES

3333

| SYMBOL | WAG | A. P.S. | PARAMETRIC VALUES |
|--------|-------|---------|-------------------|
| COL | 2.498 | ROOF | 20.000 ELEV |
| | 3.522 | | .000 ROOF |
| | | | -20.000 |
| | | | 40.000 |

SECRET

CONFIDENTIAL

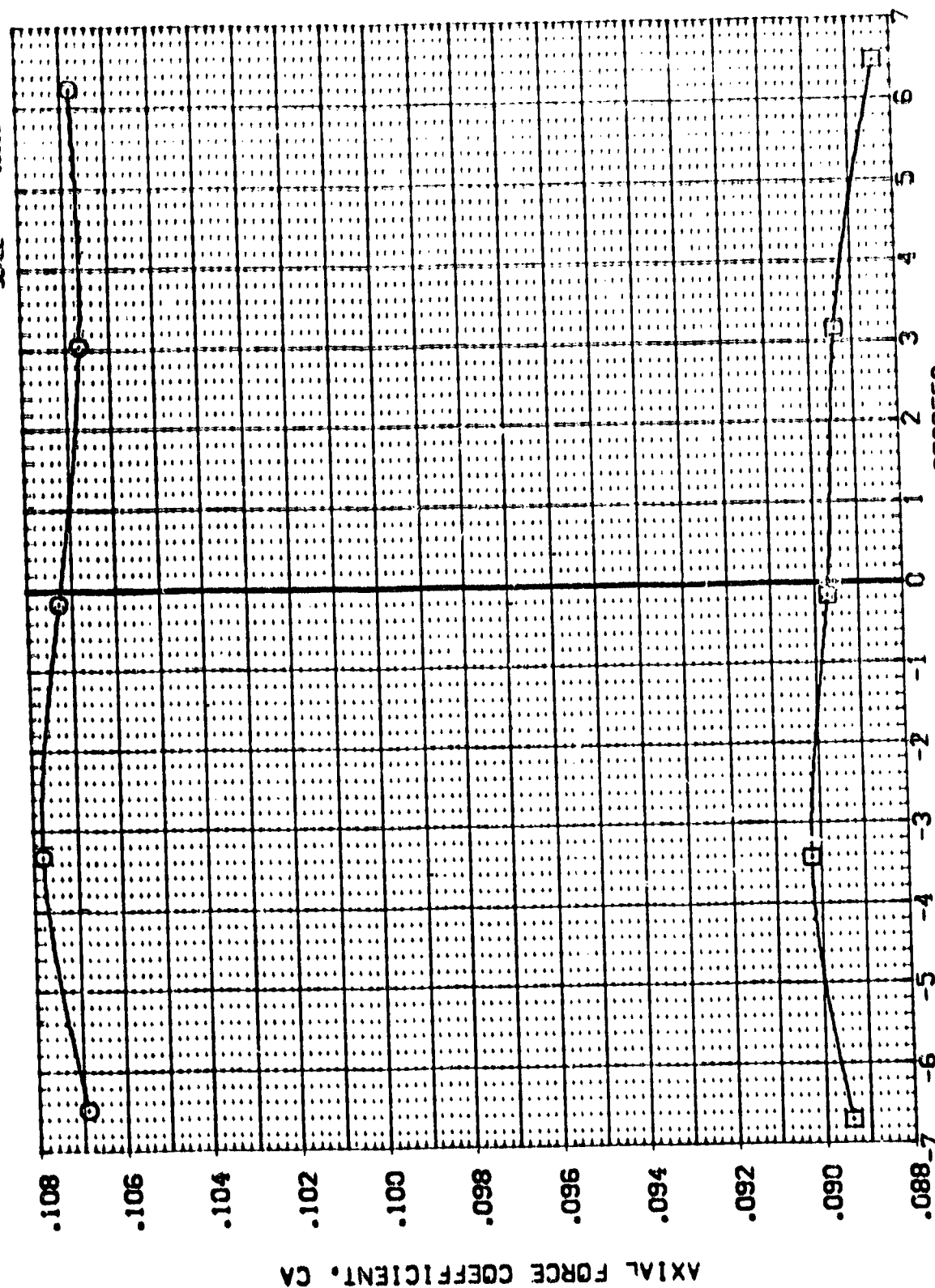


FIG. 61 ORBITER LAT-DIR. AERO DATA. ALPHA=20. RUDDER=-20. ELEVON=-20 DEGS. $\gamma_N=2.5, 3.5$

(R80013)

AVES 87-707-CA:2

SYMBOL

3.502

ALPHA
RUDDER

PARAMETER
20.000
.000

1.000
10.000

REFERENCE INFORMATION
SREF 2.4210
LREF 38.8490
BREF 38.8490
XPRD 32.3000
YPRD 1.0000
ZPRD 1.0000
SCALE 1.0000

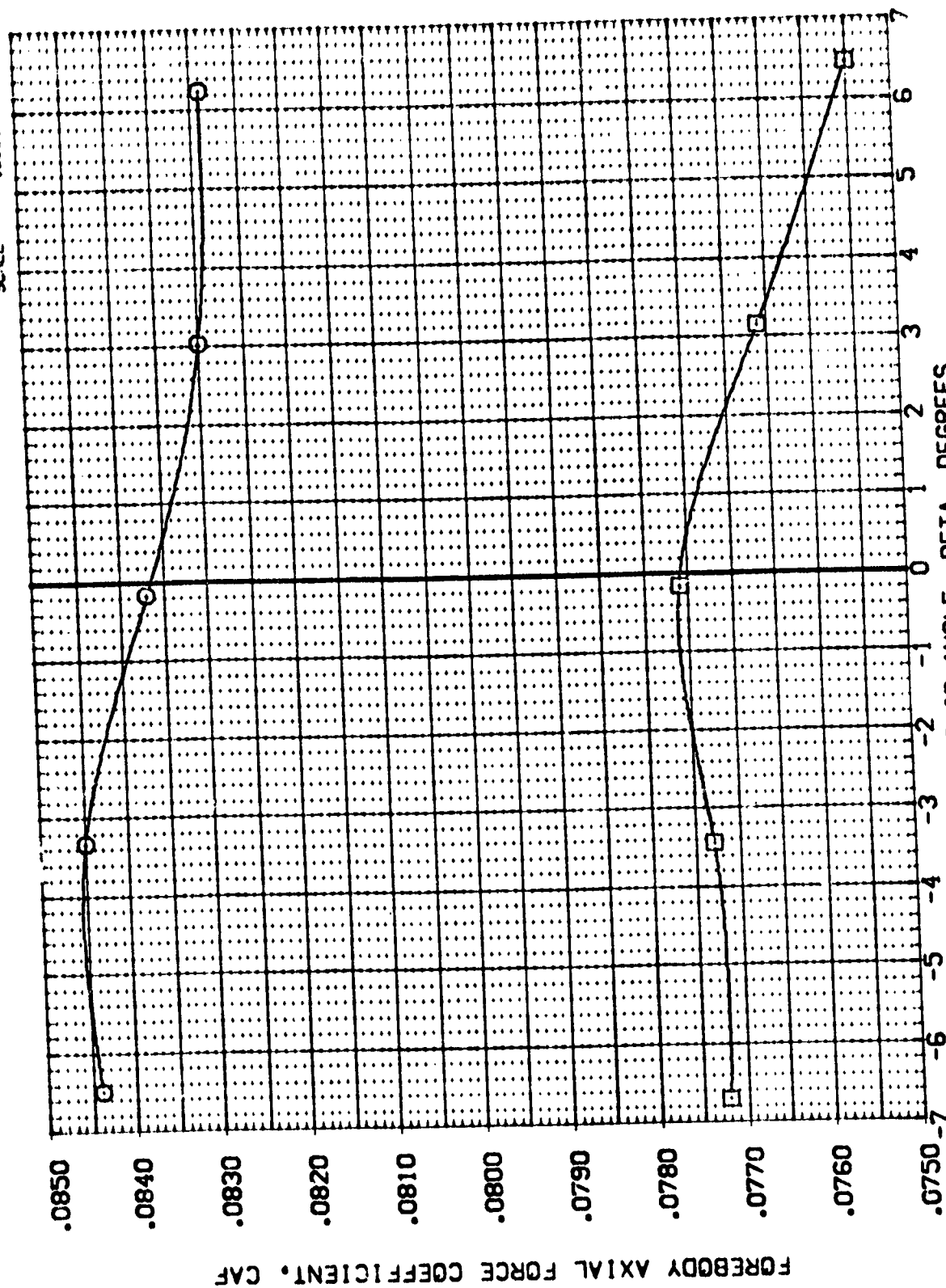


FIG. 61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
SIDESLIP ANGLE, BETA, DEGREES
PAGE 5:4

(RB0013)

AVES 87-707-CA:2 32A

SYMBOL VAC-
2.498 ALPHA 20.000 ELEVON -20.000
3.502 RUDDER .000 RUDDER 40.000

REFERENCE INFORMATION
SPEC 2.4213
LREF 39.8490
BREF 39.8490
VREF 31.2000
VREF 31.2000
SCALE 0.0000

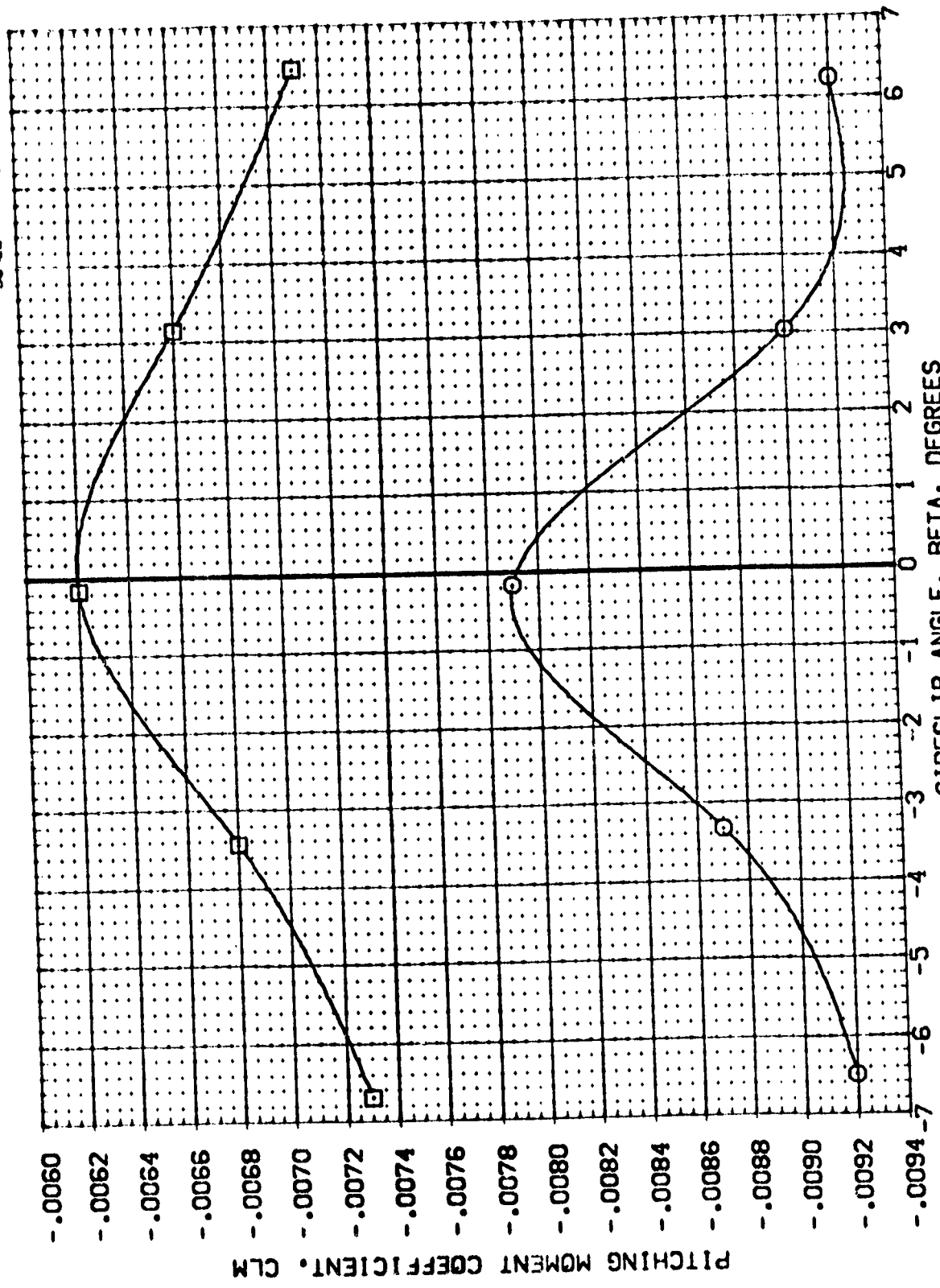


FIG.61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
PAGE 5:6

III

(R80013)

AMES 87-707-2A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | ELEVON |
| □ | 2.498 | 20.000 | -20.000 |
| □ | 3.502 | 0.000 | 40.000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| YREF | 37.3000 |
| ZREF | 0.0000 |
| SCALE | 0.0000 |

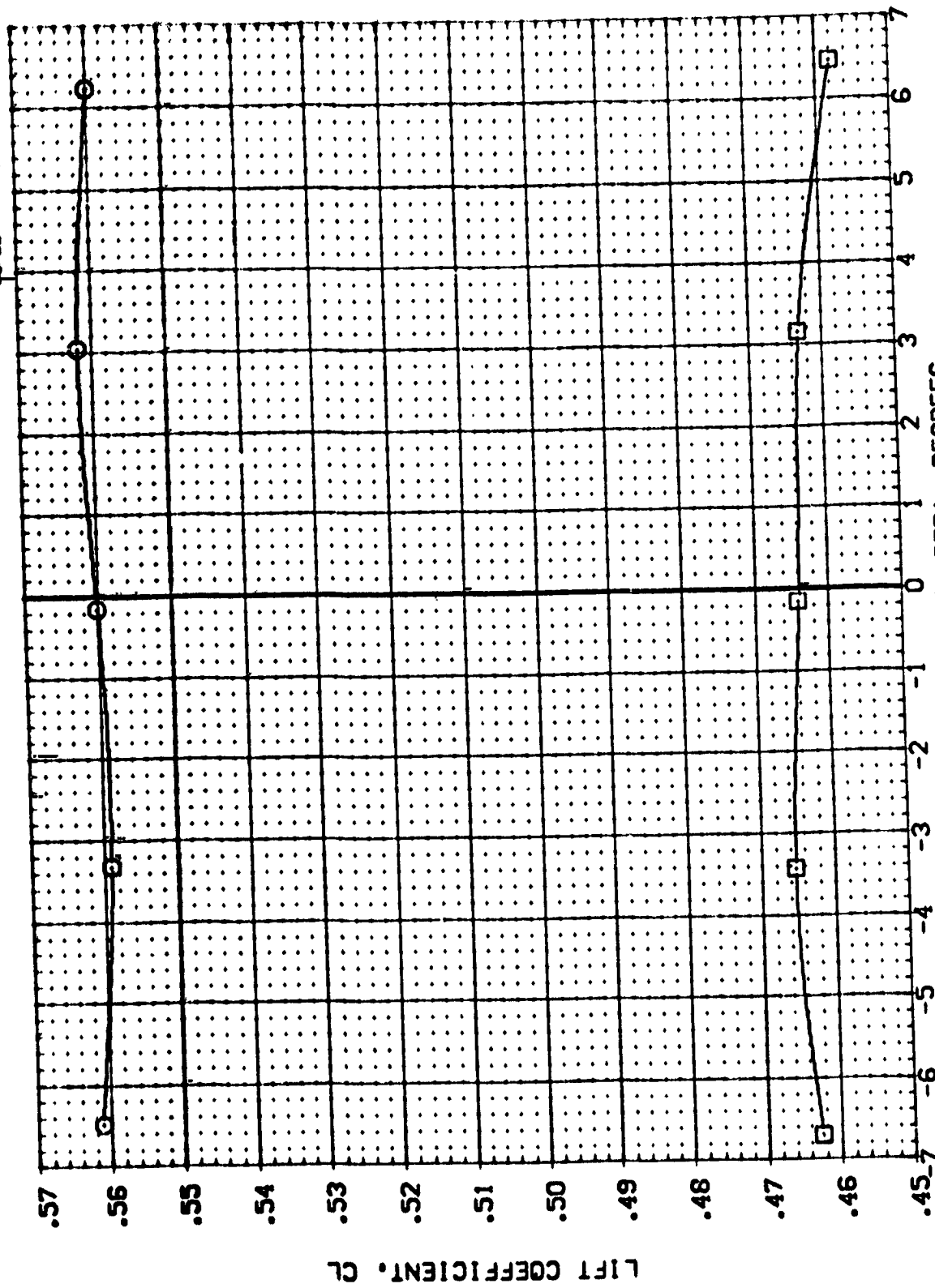


FIG. 61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
 Sideslip Angle, BETA, DEGREES
 PAGE 5:7

[R80013]

AMES 87-707-CA:2 C2A

| SYMBOL | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | -20.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|---------|--------|
| | 2.498 | | | | | | |
| | 3.502 | | | | | | |

REFERENCE INFORMATION

| SYMBOL | VALUE | SCALE |
|--------|---------|-------|
| SREF | 2.4212 | SCALE |
| LREF | 39.8450 | SCALE |
| BREF | 38.8150 | SCALE |
| XREF | 32.3000 | SCALE |
| YREF | 0.0000 | SCALE |
| ZREF | 0.0000 | SCALE |
| SCALE | 0.0000 | SCALE |

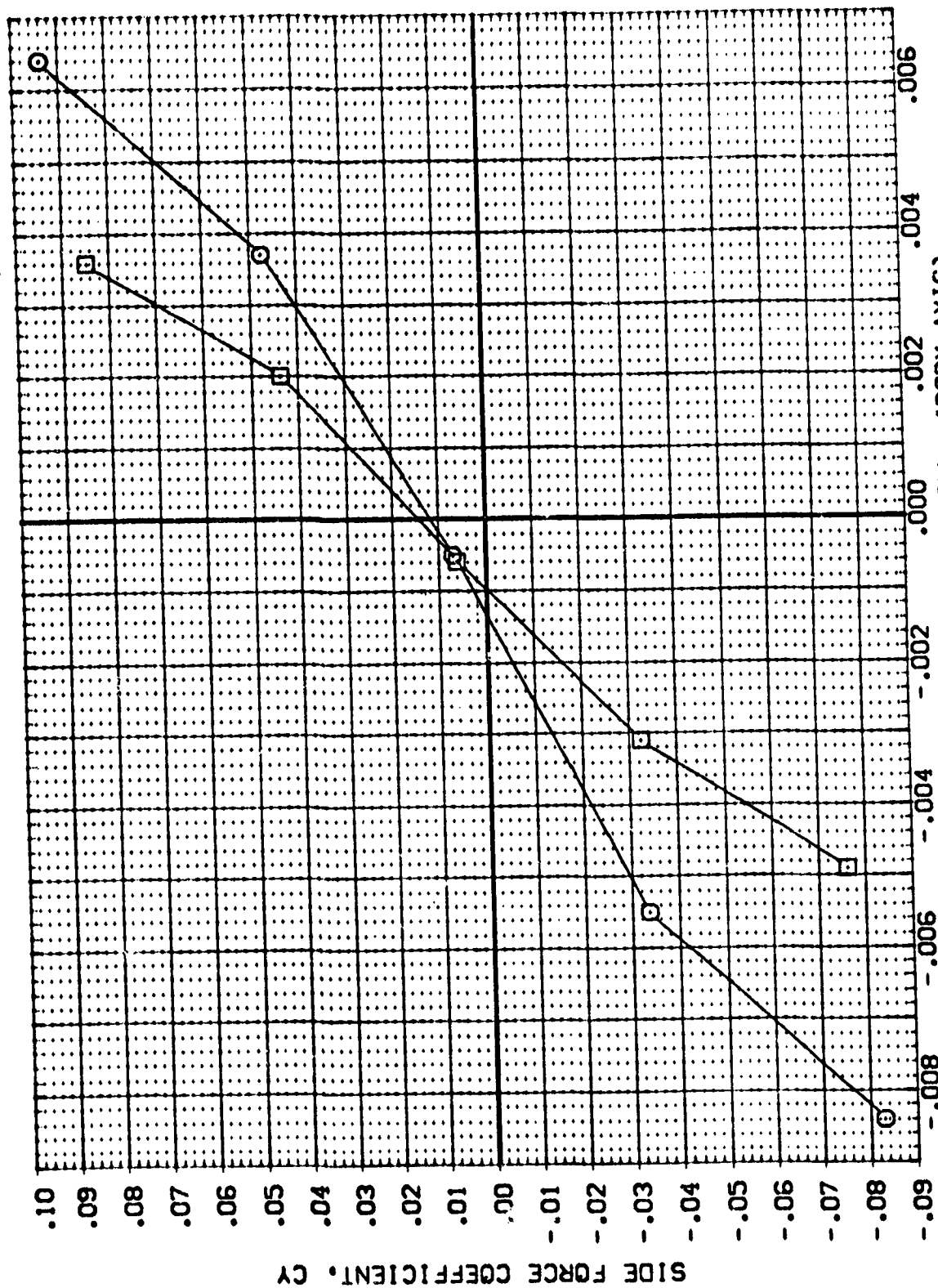


FIG.61 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

AMES 87-7C7-0A12 02A

| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES |
|--------|-------|-------|-------------------|
| ○ | 2.498 | .000 | ELEVON |
| | 2.502 | .000 | ROTOR |
| | | | -40,000 |
| | | | 40,000 |

PARAMETRIC VALUES

40.000
40.000

| SPREF | 2.4210 | SCALE |
|-------|---------|-------|
| LREF | 19.8490 | |
| BREF | 19.8490 | |
| WAPP | 17.3000 | |
| WAPP | 17.3000 | |
| WAPP | 17.3000 | |
| SCALE | 0.0000 | |

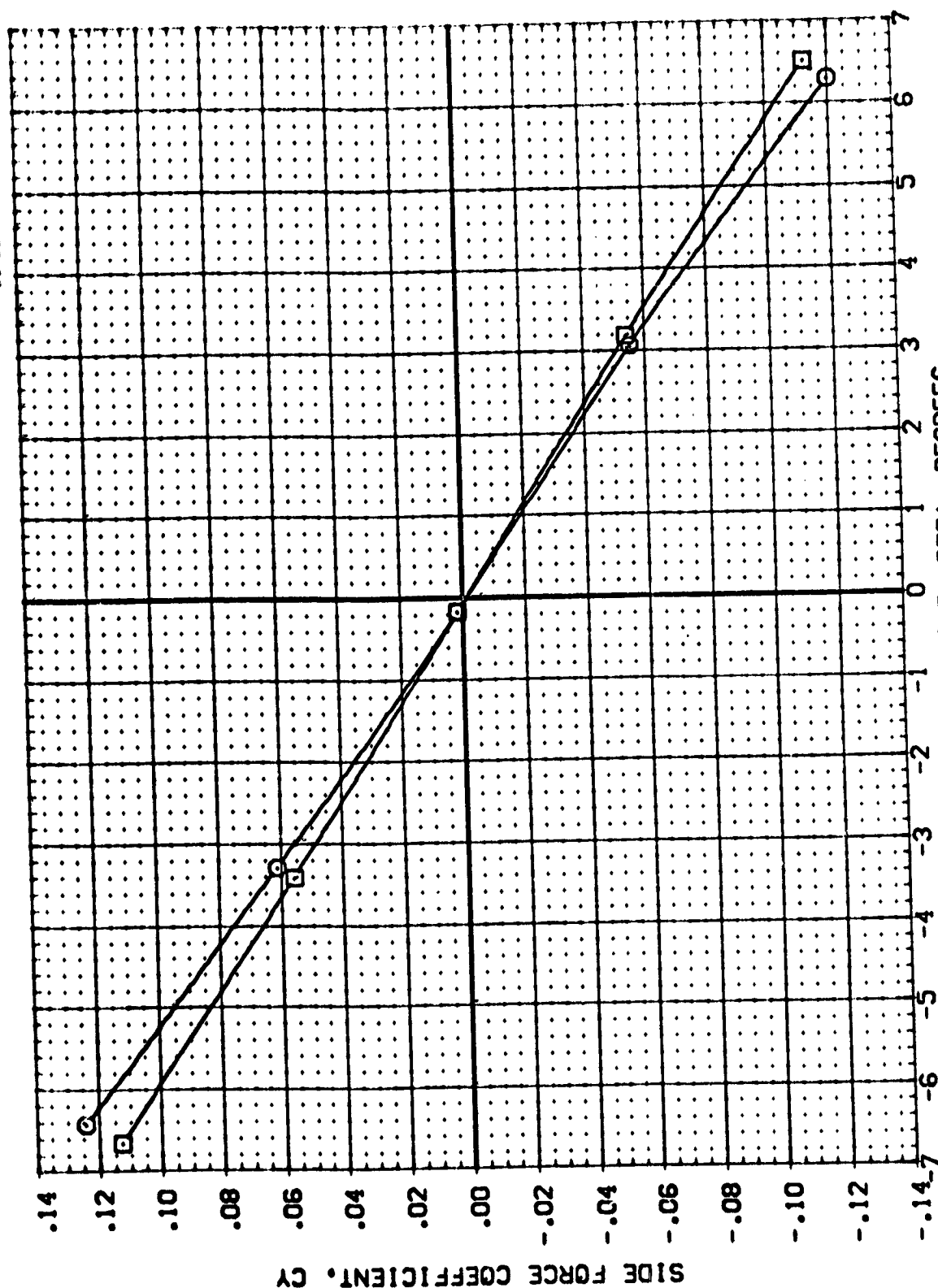


FIG. 62 ORBITER LAT-DIR. AERO DATA. ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS. MN=2.5, 3.5
 SIDLIP ANGLE. BETA. DEGREES
 14.7 -6 -5 -4 -3 -2 -1 0
 PAGE 519

(RB0014)

AMES 87-707-0A12 G2A

| SYMB. | MACH | PARAMETRIC VALUES | | | |
|-------|-------|-------------------|---------|--------|--------|
| | | ALPHA | ELEVON | RUDDER | RUDDER |
| □ | 2.498 | .000 | -40.000 | | |
| ○ | 3.503 | .000 | 40.000 | | |

REFERENCE INFORMATION
SREF 2.4213
LREF 39.8490
BREF 39.8490
XGRP 32.3000
YGRP 0.0000
ZGRP 0.0000
SCALE 0.0000

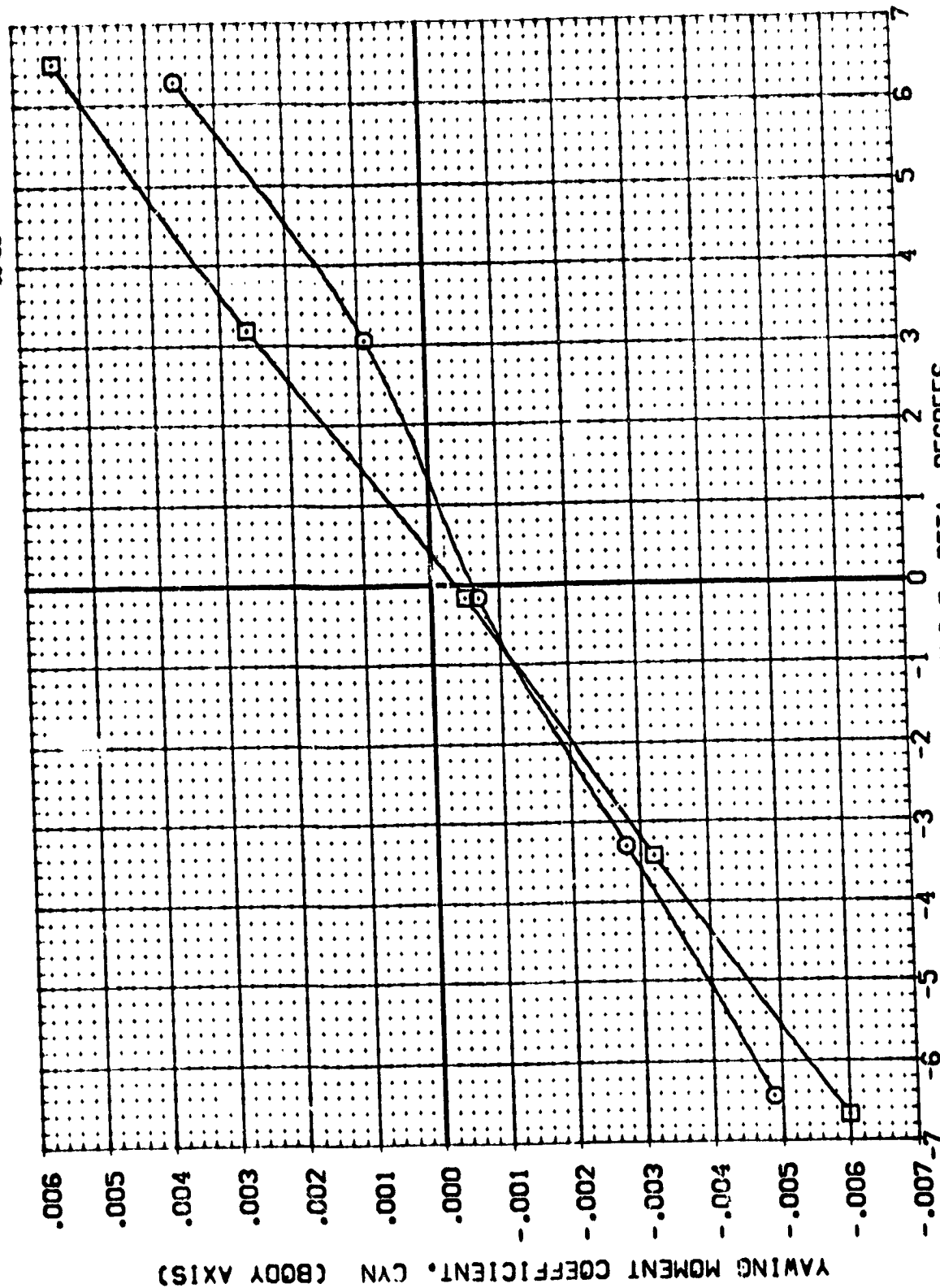


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
PAGE 520

(RB00014)

AMES 87-707-GA12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | ELEVON |
| □ | 2.498 | .000 | -40.000 |
| □ | 3.503 | .000 | 40.000 |

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 39.849C
 BRPF 39.849C
 XREF 32.300C
 YREF .000C
 ZREF .000C
 SCALE .000C

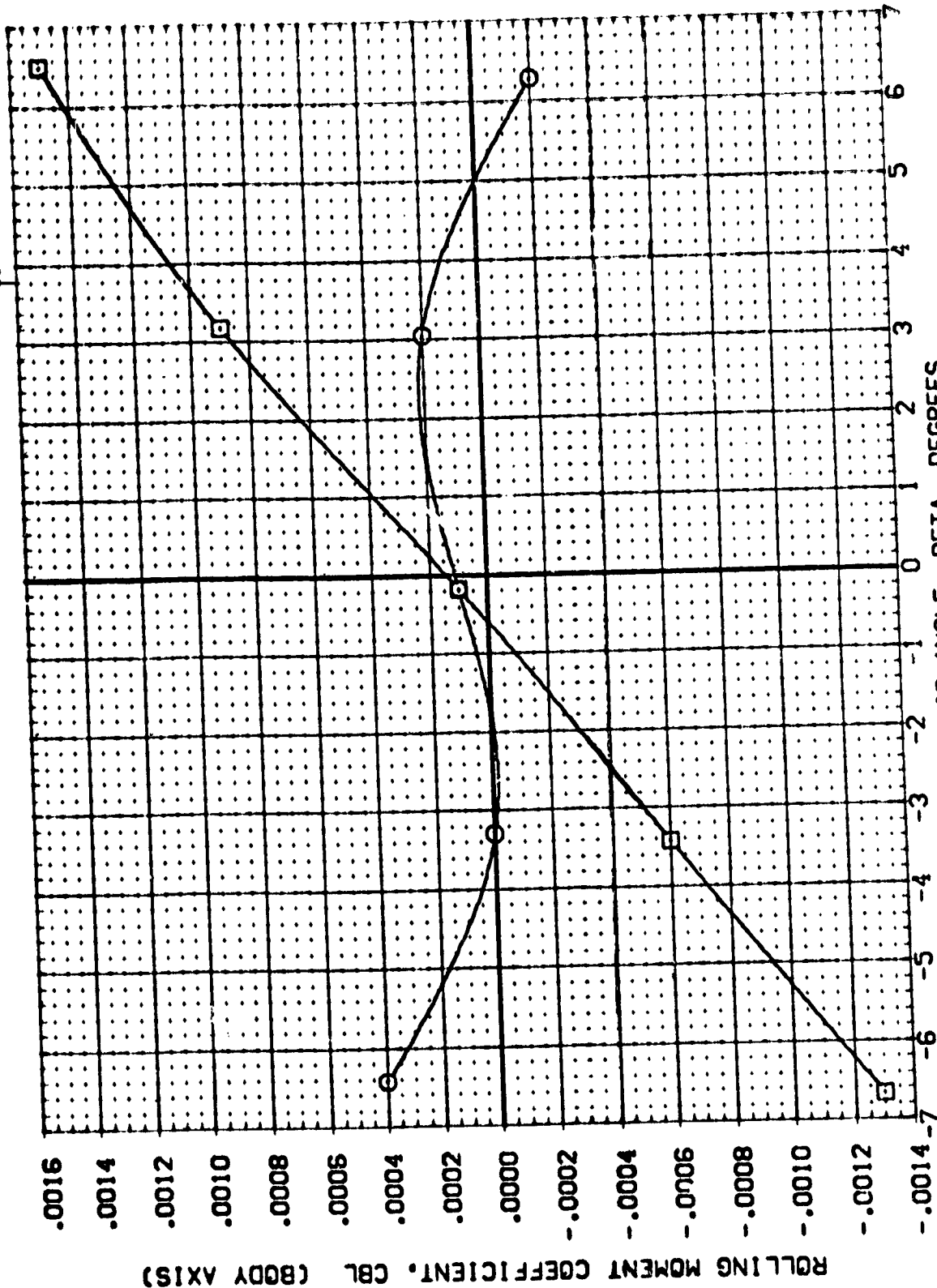


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
 Sideslip Angle, Beta, Degrees
 PAGE 52:

(R80014)

AMES 87-707-CA12 02A

| SYMBOL | WACH | PARAMETRIC VALUES | | |
|--------|-------|-------------------|---------|--------|
| | | ALPHA | ELEVON | RUDDER |
| PO | 2.498 | .000 | -40.000 | |
| | 3.503 | .000 | 40.000 | |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XREF | 37.3000 |
| YREF | 0.0000 |
| ZREF | 0.0000 |
| SCALE | 0.0000 |

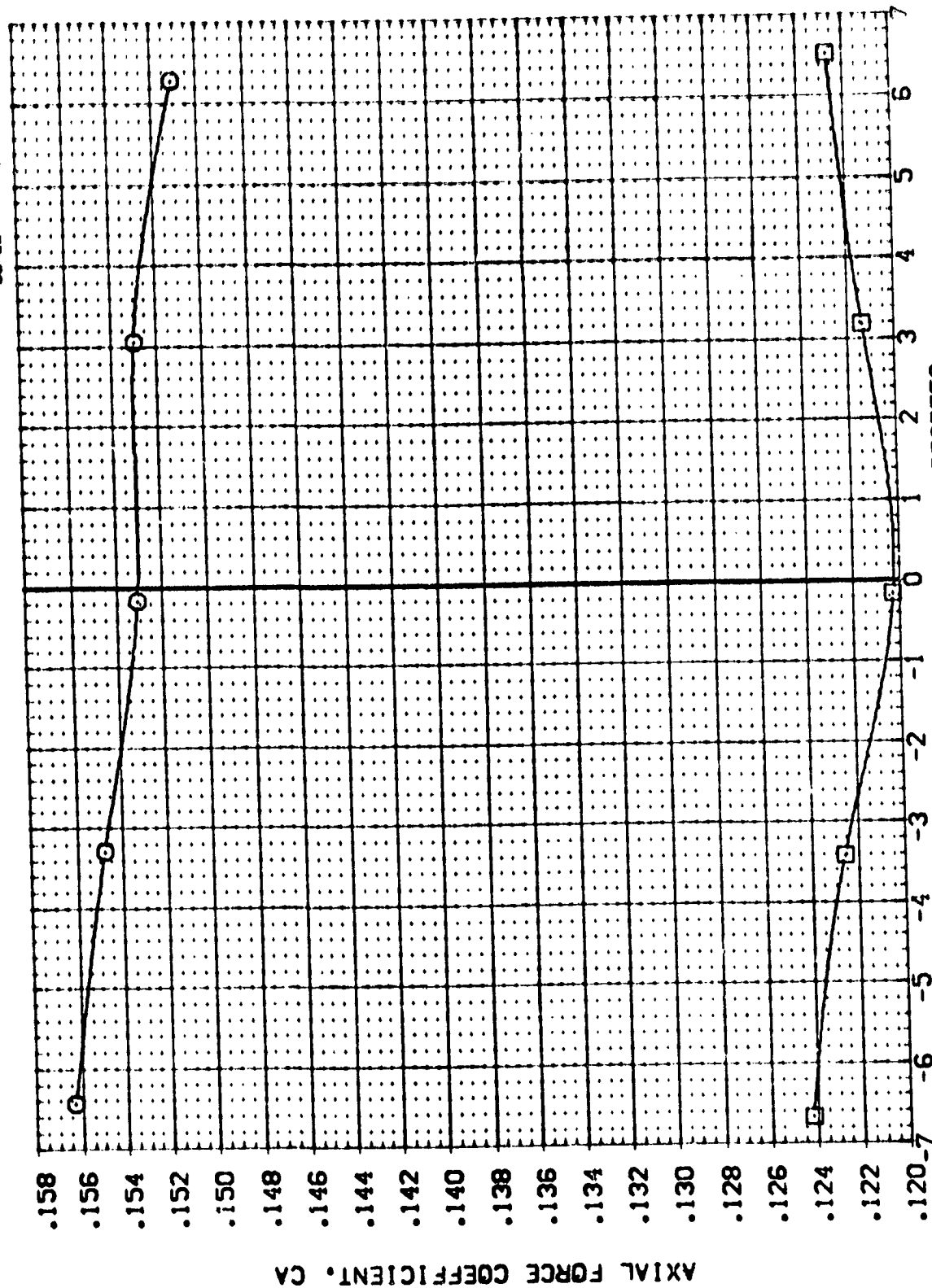


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 522

(R80014)

AVES 87-707-CA12 02A

| SYMBOL | WAC | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | ELEVON |
| ○ | 2.498 | .000 | -40.000 |
| □ | 3.503 | .000 | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4215 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XREF | 32.3000 |
| YREF | .0000 |
| ZREF | .0000 |
| SCALE | .0000 |

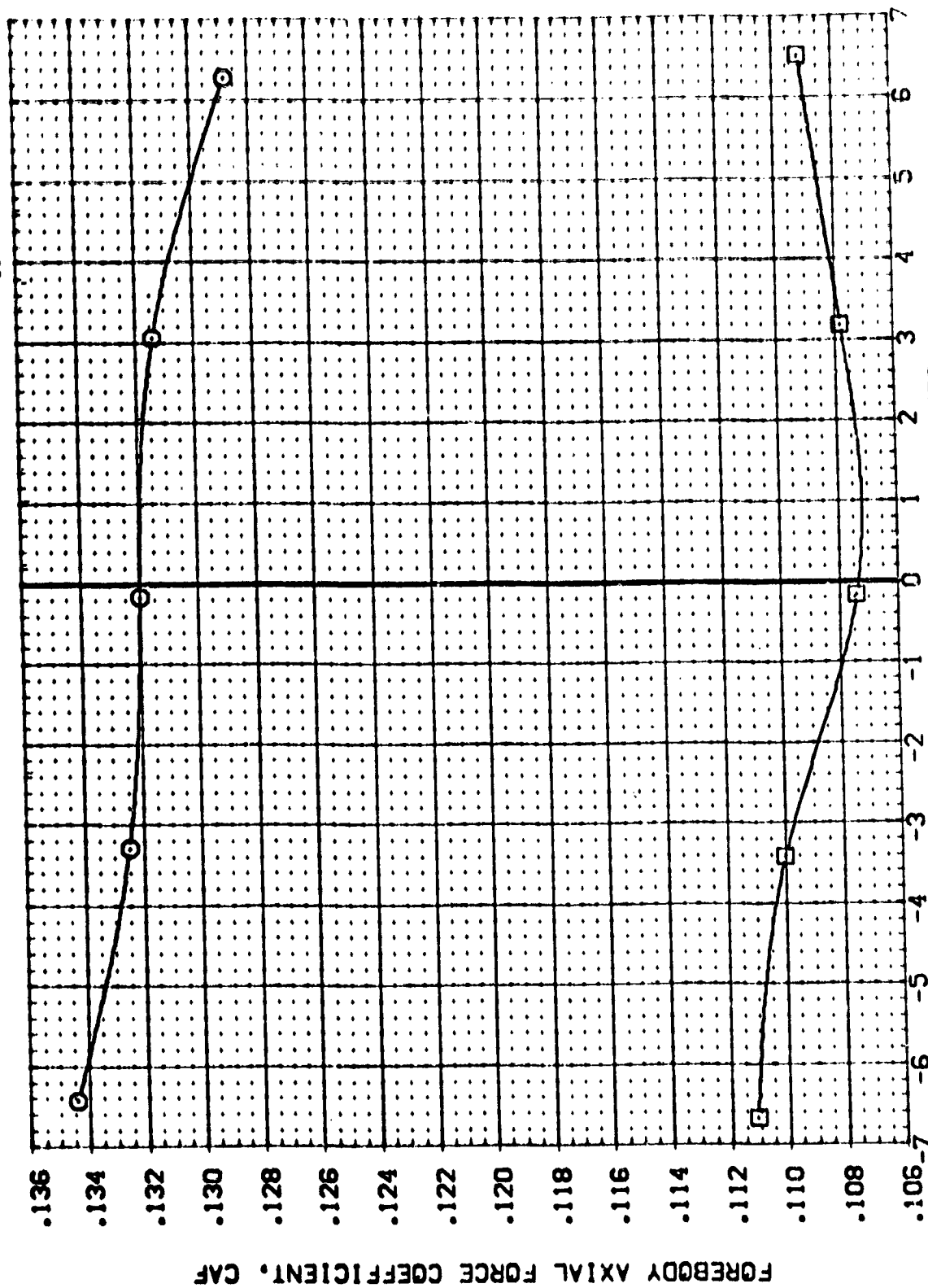


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(RBG0014)

AVES 87-707-0A12 02A

| PARAMETRIC VALUES | |
|-------------------|---------|
| MAC | 2.498 |
| ALPHA | 0.000 |
| RUDDER | 0.000 |
| ELEVON | -40.000 |
| RUOTLR | 40.000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| SPEC | 2.4210 |
| REF | 39.8450 |
| SPES | 39.8450 |
| APRO | 21.0000 |
| YPOO | 0.0000 |
| ZPOO | 0.0000 |
| SCALE | 0.0000 |

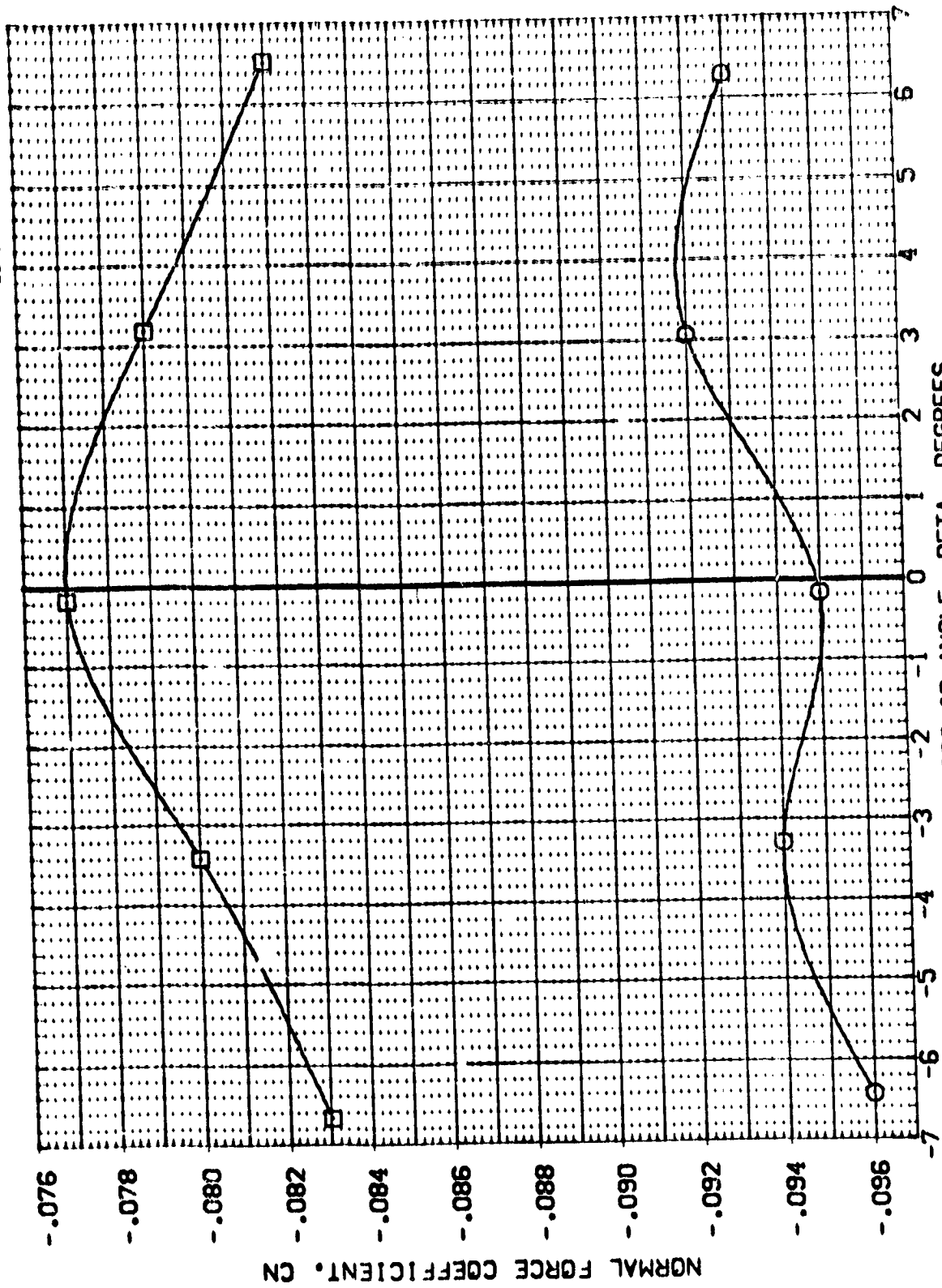


FIG.62 ORBITER LAT-DIR. AERO DATA. ALPHA=0. RUDDER=-20. ELEVON=-40. DEGS. YN=2.5. 3.5
 SIDESLIP ANGLE. BETA. DEGREES
 PAGE 524

(R30014)

AVES 87-707-0A12 02A

| SY-SOL | PAC-H | ALPHA | PARAMETRIC VALUES | ELEVON | -40.000 |
|--------|-------|--------|-------------------|--------|---------|
| 2.498 | 3.503 | RUDDER | .000 | RUOFLR | 40.000 |

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 X-PRD 30.3000
 Y-PRD 1000
 Z-PRD 1000
 SCALE

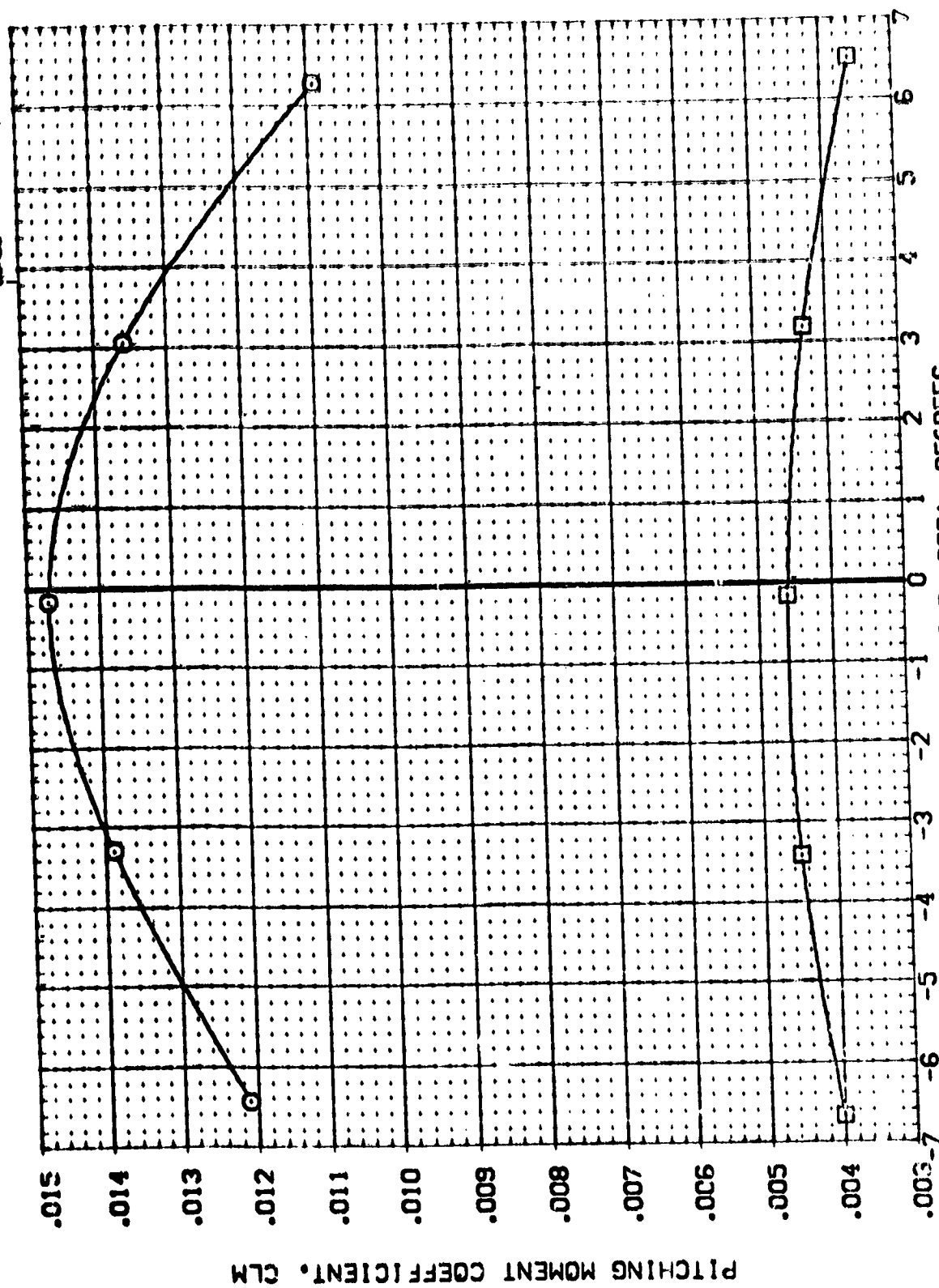


FIG. 62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, YN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 525

[R33014]

AVES 87-707-CA12 32A

SYMBOL MACH ALPHA RUDDER
2.498 3.503
PARAMETRIC VALUES
.000 .000
ELEVON RUDDER
-40.000 40.000

REFERENCE INFORMATION
SHEET 2.420
REF 28.845C
REF 28.845C
XPRD 30
XPRD 1000
XPRD 1000
XPRD 1000
SCALE

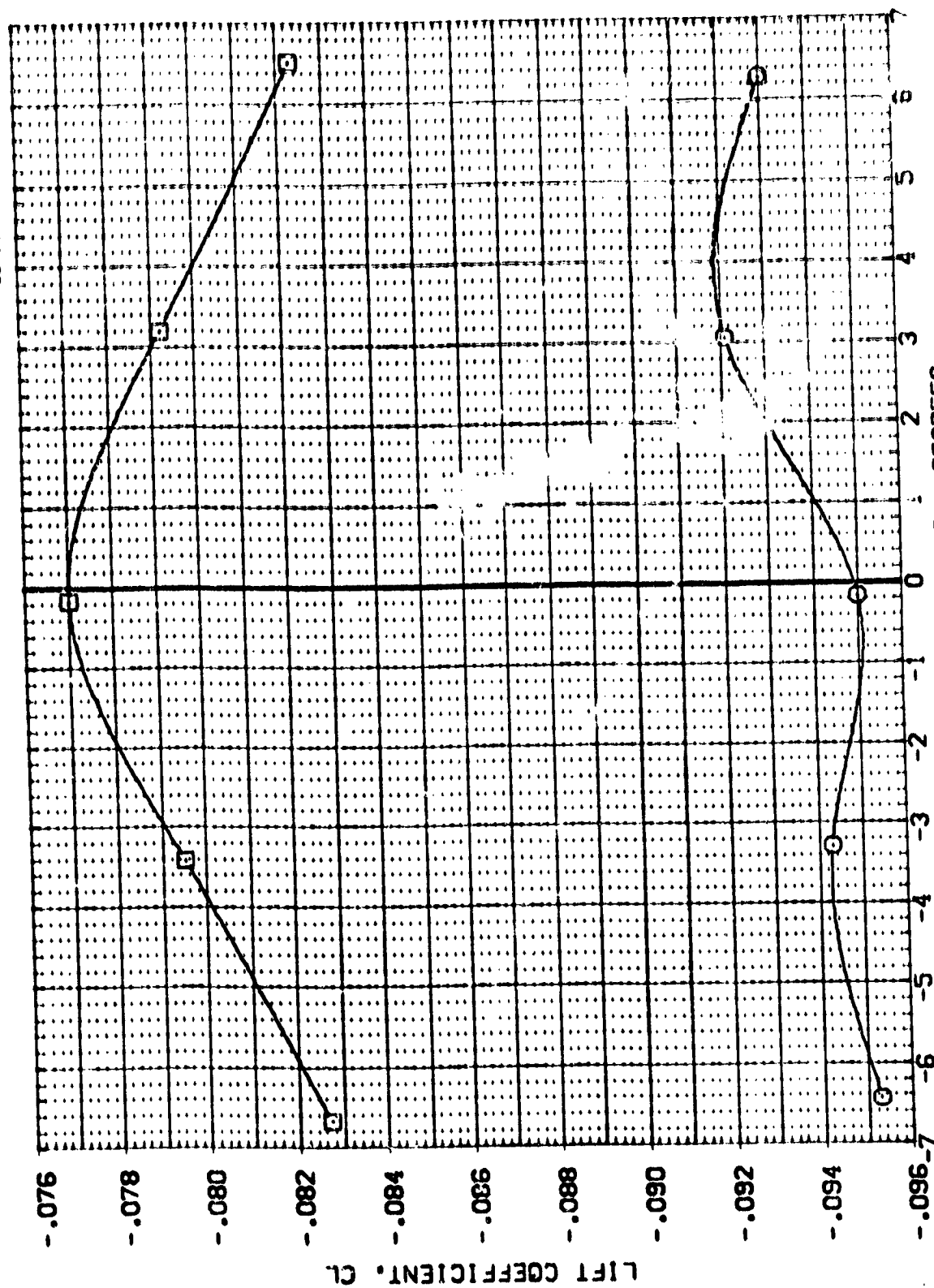


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
PAGE 52B

(RBG014)

AVES 87-707-0A12 32A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 □ 2.498 3.503 .000 .000 ELEVON RUOFLR -40.000 40.000

REFERENCE INFORMATION
 SREF 2.4210 SC.F.
 LREF 39.8490
 BREF 39.8490
 XPRD 17.3000
 YPRD 0.0000
 ZPRD 0.0000
 SCALE 0.0000

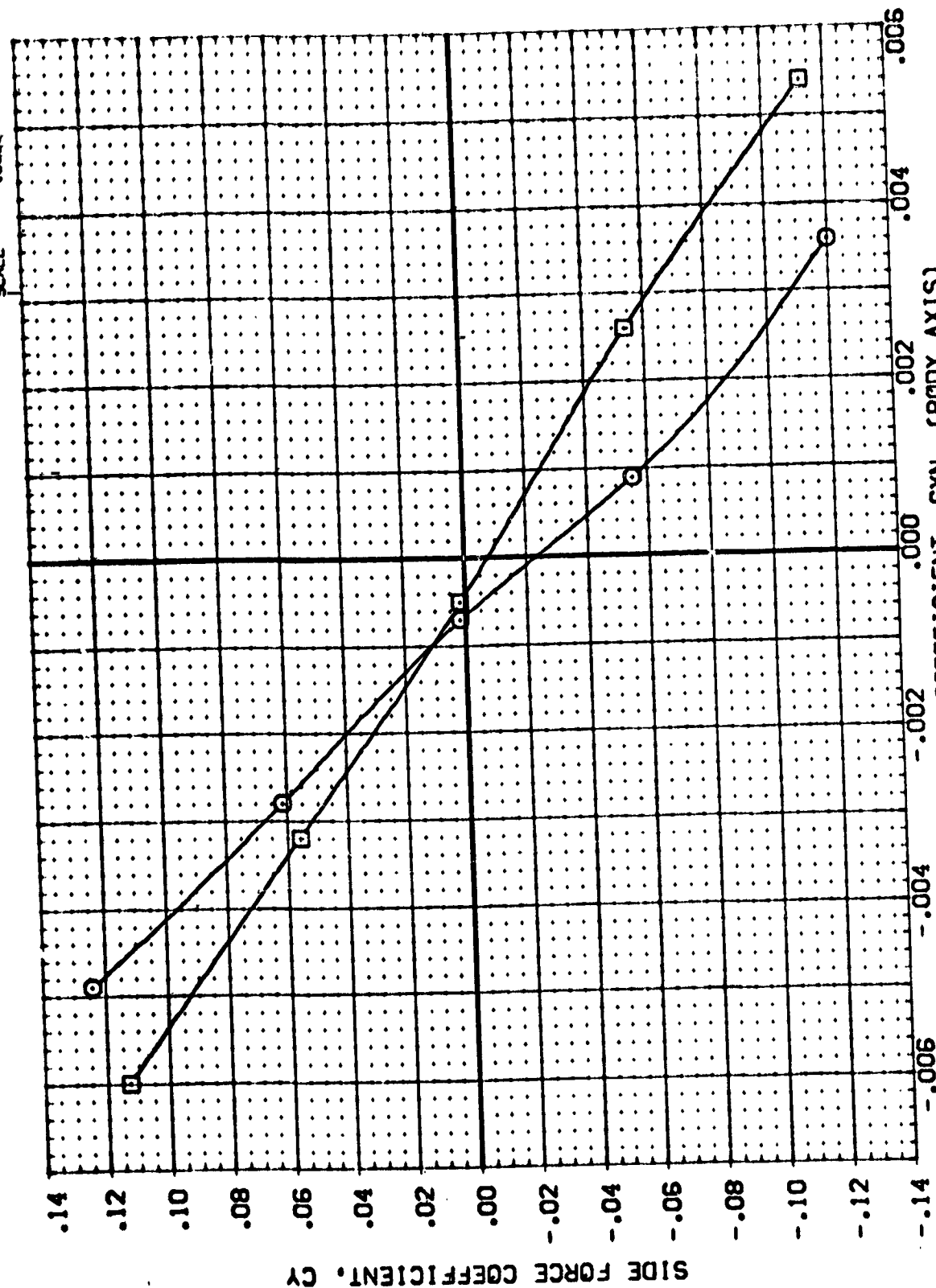


FIG.62 ORBITER LAT-DIR. AERO DATA, ALPHA=0, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
 PAGE 527

(R8G015)

AMES 87-707-CA12 32A

SYMBOL WACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDER

2.498 3.503 10.000 .000 40.000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

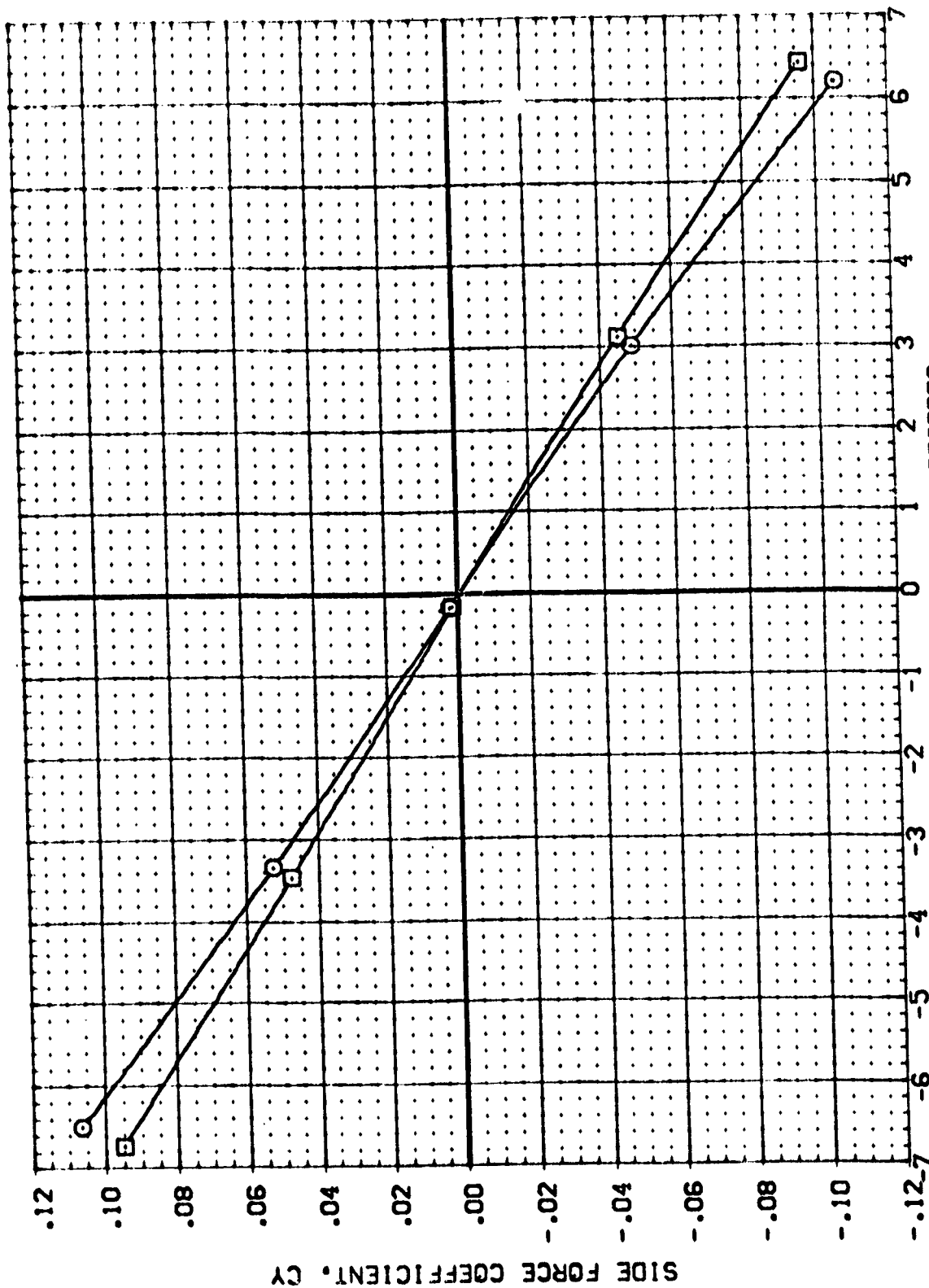


FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(RB0015)

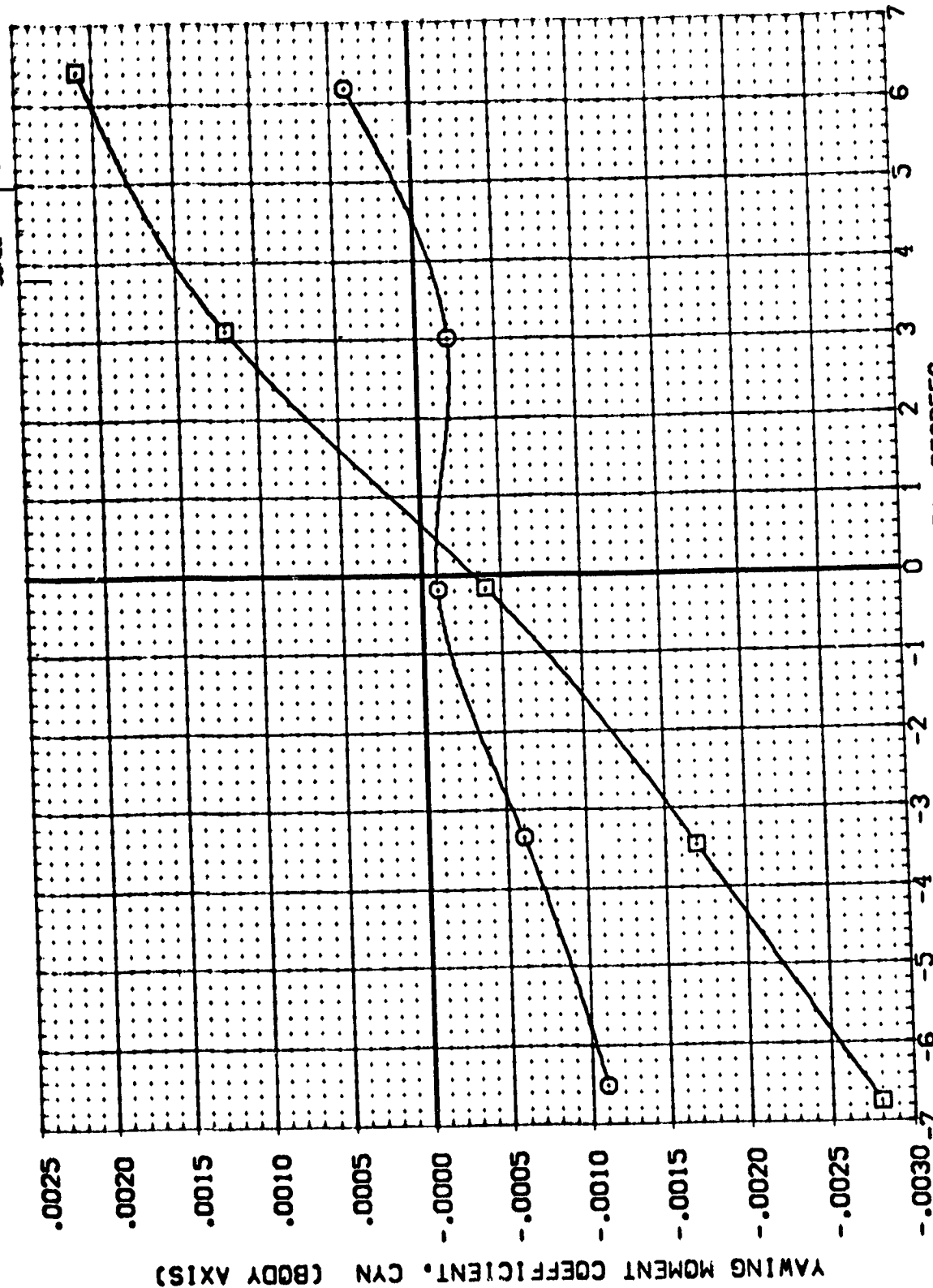
AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER
○ 2.498 10.000 0.000
□ 3.503 40.000 40.000

PARAMETRIC VALUES

ELEVON -40.000
RUELR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 32.3000
YPRP 0.0000
ZPRP 0.0000
SCALE 0.0001



SIDESLIP ANGLE, BETA, DEGREES

FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(RB0015)

AMES 87-707-CA12 02A

SYMBOL MACH PARAMETRIC VALUES
□ 2.498 ALPHA 10.000 ELEVON -40.000
□ 3.503 RUDDER .000 RUDFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 3300

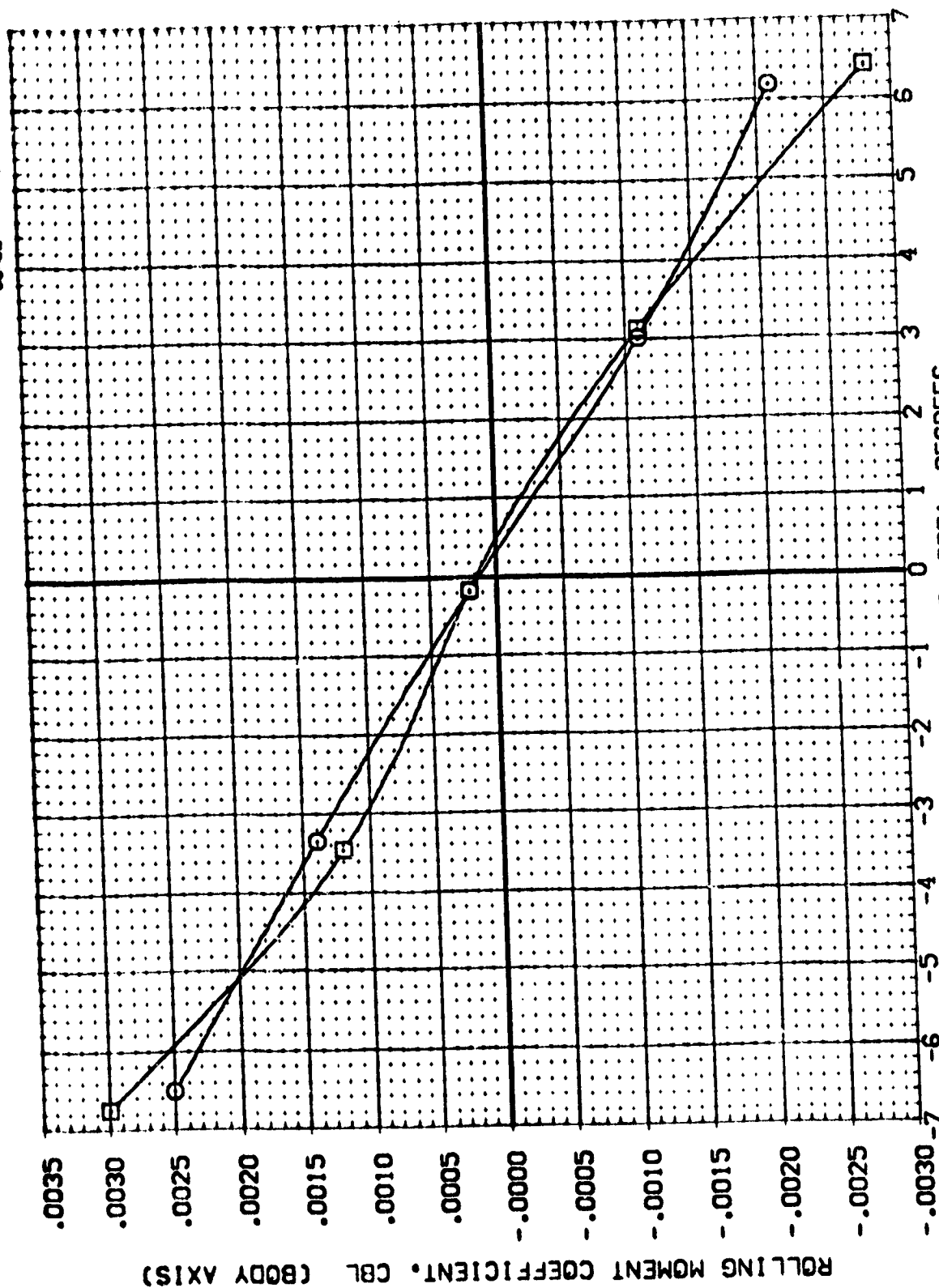


FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
PAGE 53C

(RB0015)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDFLR -40.000 40.000
○ 2.498 10.000 .000 .000 .000 .000 .000 .000
□ 3.503 10.000 .000 .000 .000 .000 .000 .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000

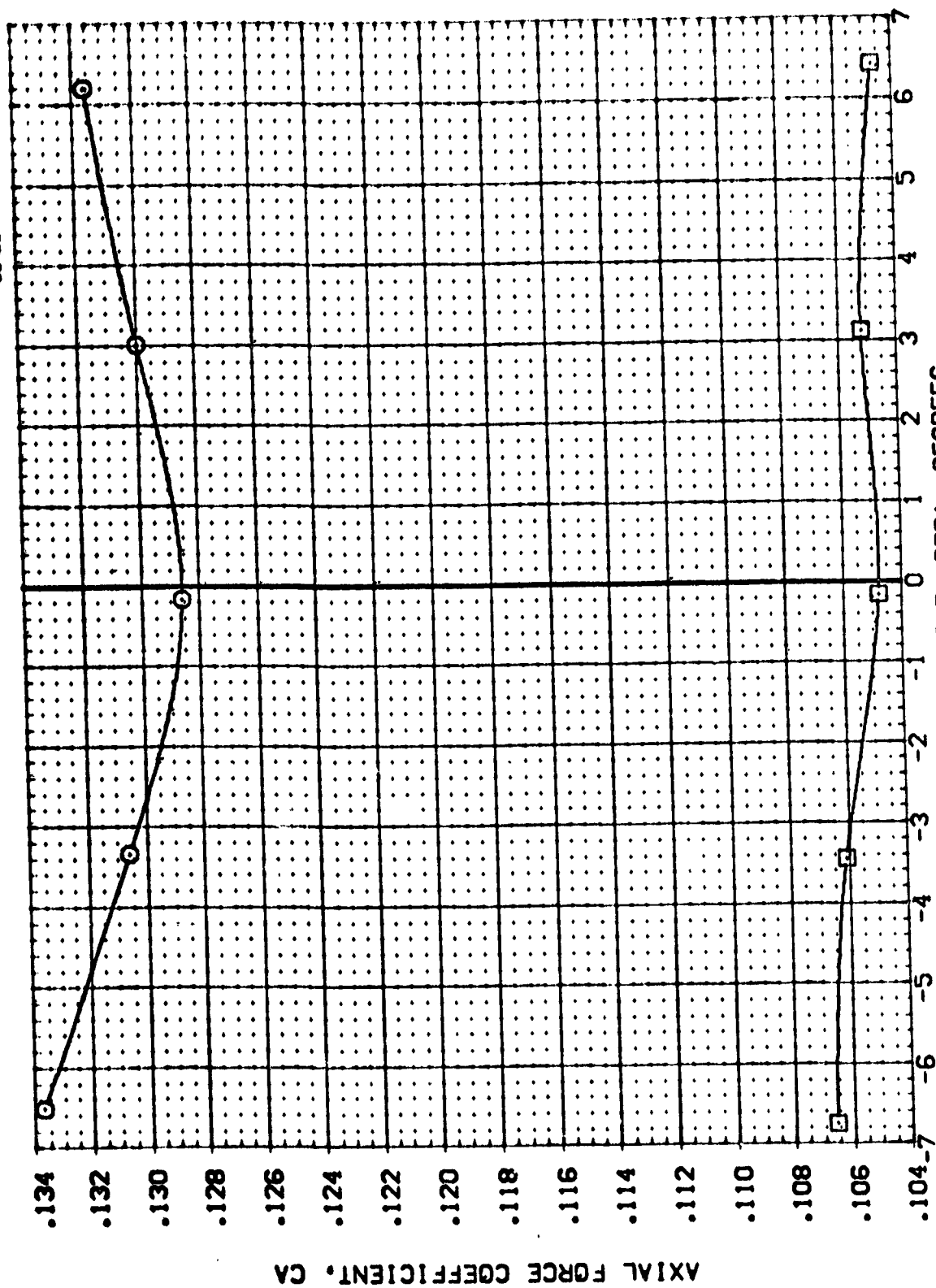


FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

TOBAS (OL)

| | | | |
|--------|--------|--------|---------|
| ALPHA | 10,000 | ELEVEN | -10,000 |
| ROOFER | .000 | ROOFER | 10,000 |

| | |
|-------|---------|
| SREF | 2.42:D |
| LREF | 39.849C |
| BREF | 37.649C |
| XPRP | 32.300C |
| YPRP | 30.000C |
| ZPRP | 30.000C |
| SCALE | 3000 |

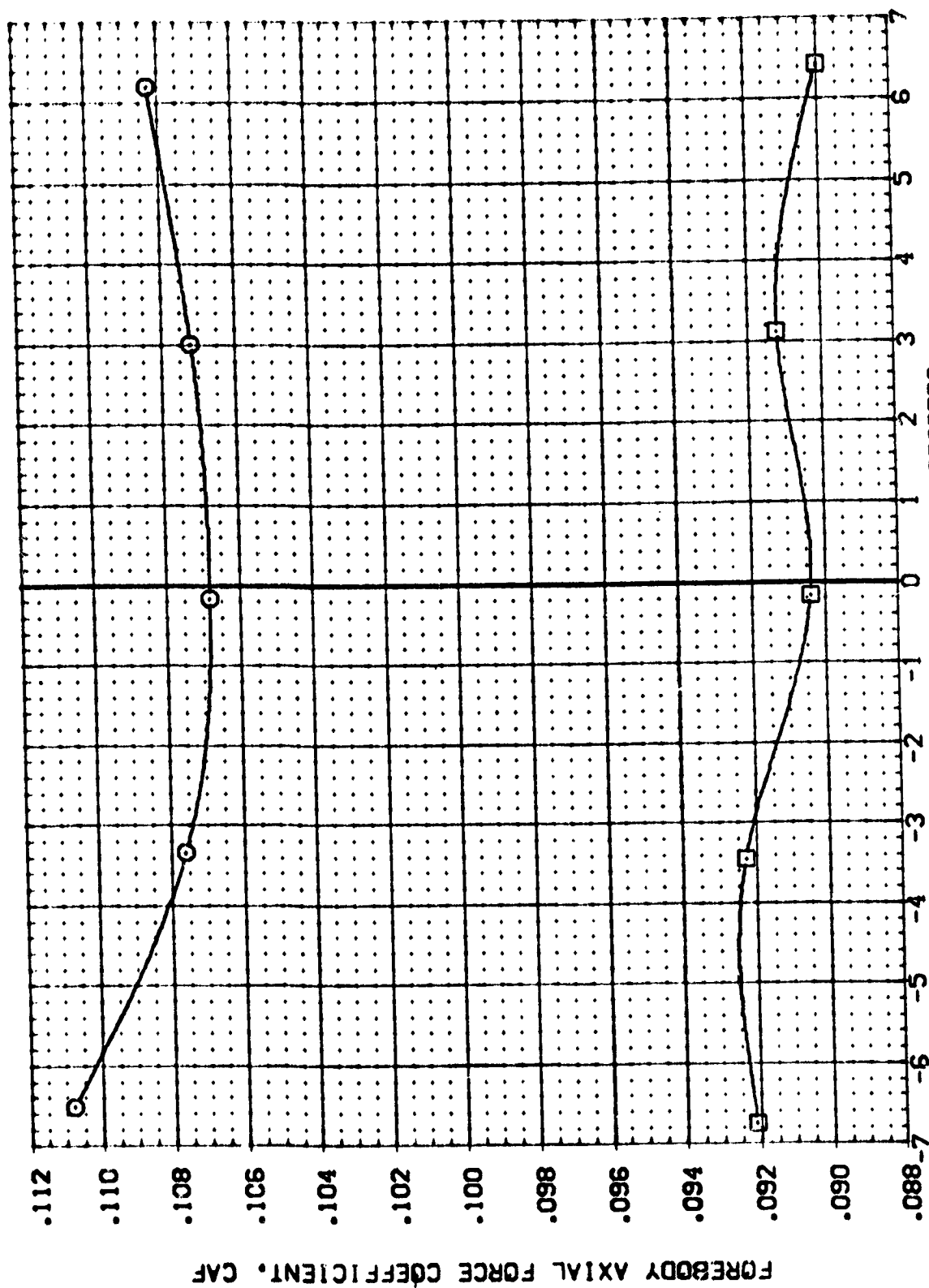


FIG. 63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

AMES 87-707-0A12 32A

(R30015)

SYMBOL MACH ALPHA RUDDER
 O 2.498 10.000 ELEVON -40.000
 □ 3.503 .000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XREF 32.3000
 YREF .0000
 ZREF .0000
 SCALE .0307

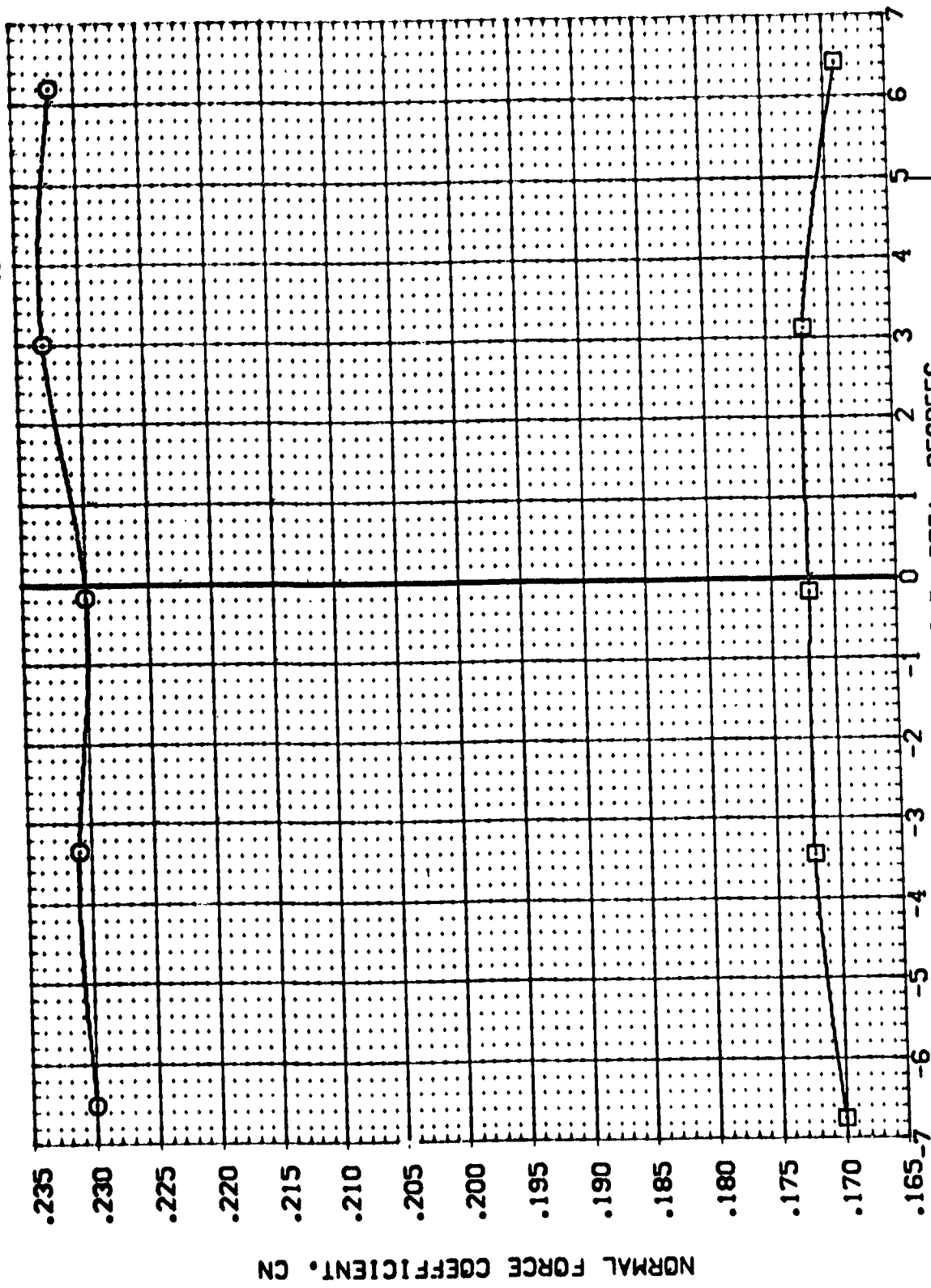


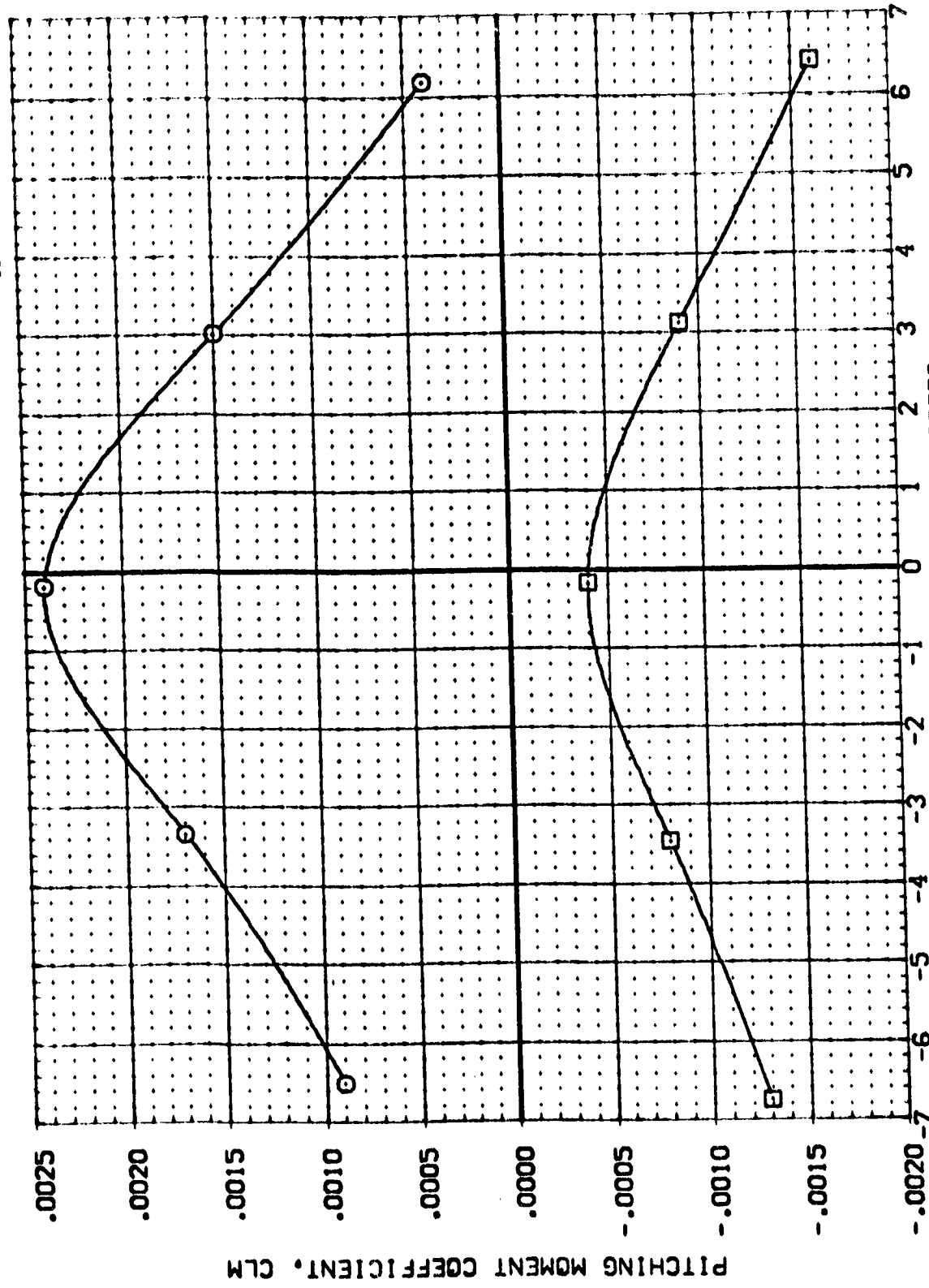
FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 533

(RBG015)

AMES 87-707-GA12 G2A

SYMBOL WAC-
2.498
3.503
PARAMETRIC VALUES
C.O.OO ELEVON -40.000
.000 RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

[R80015]

AMES 87-707-0A12 02A

| | | | | | | |
|--------|-------|-------|--------|-------------------|---------|--------|
| SYMBOL | MACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUOFLR |
| □ | 2.498 | 3.503 | | 10.000 | -40.000 | 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SC.FT. |
| REF | 19.8450 | IN. |
| BREF | 19.8450 | IN. |
| XPRD | 17.3000 | IN. |
| YPRD | .0000 | IN. |
| ZPRD | .0000 | IN. |
| SCALE | .0000 | SCALE |

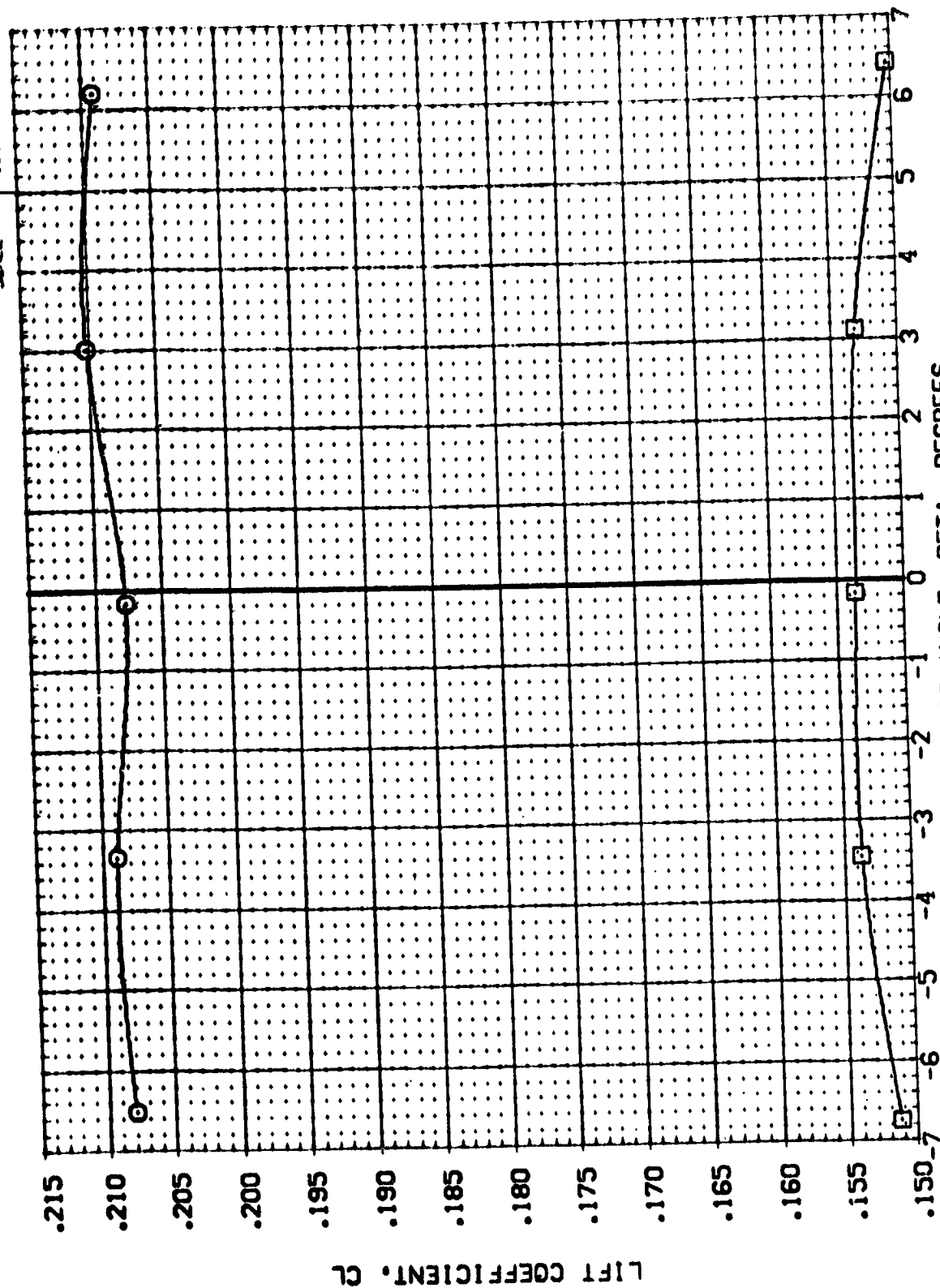


FIG. 63 ORBITER LAT-DIR. AERO DATA. ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS. MN=2.5, 3.5

(R300015)

AVES 87-707-CA:2 32A

SYMBOL WAC-1 ALPHA 10.000 ELEVON -40.000
3.503 RUDDER .000 RUDDER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
XREF 39.8450
YREF 37.3000
ZREF 1.0000
SCALE

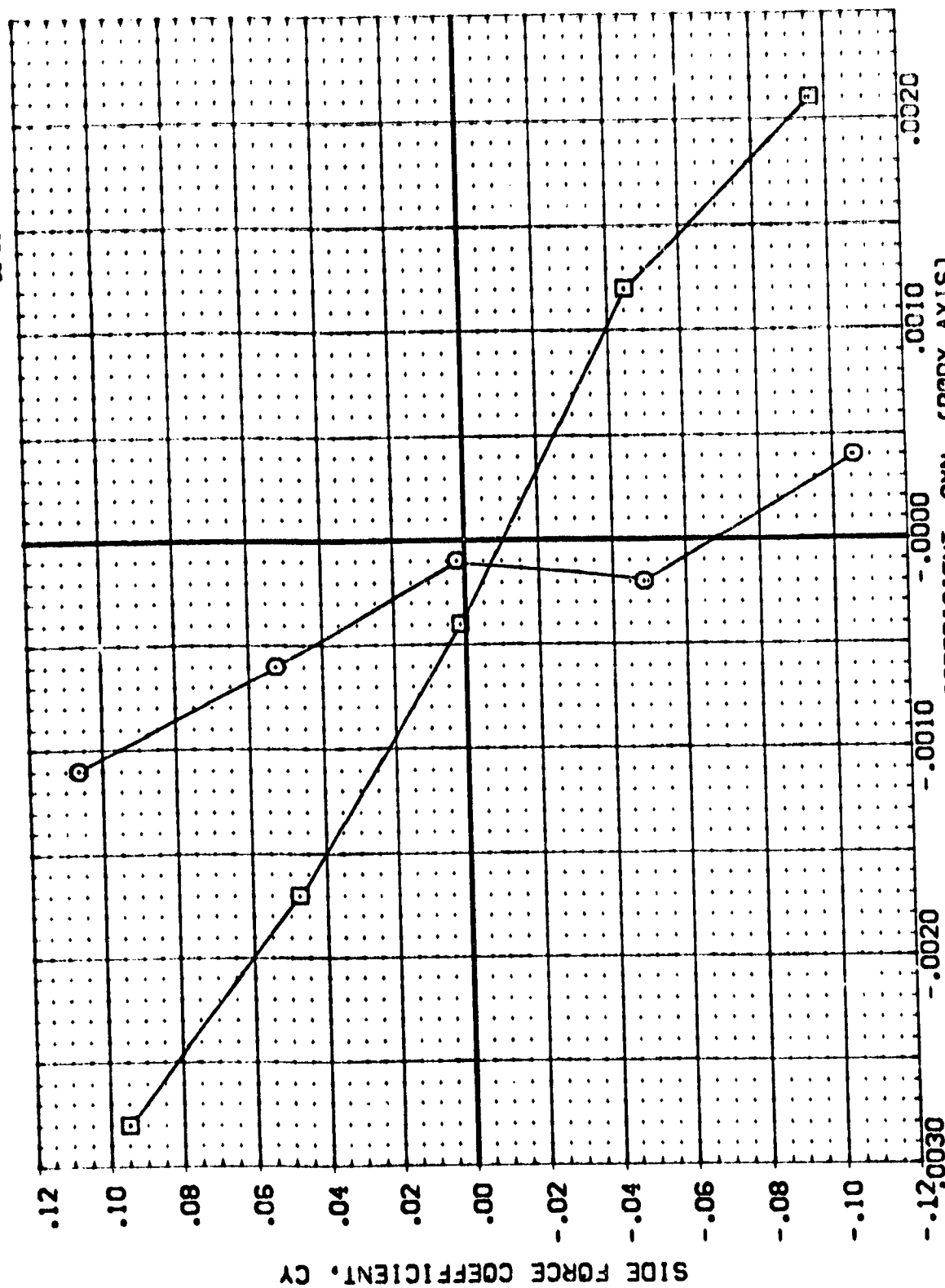


FIG.63 ORBITER LAT-DIR. AERO DATA, ALPHA=10, RUDDER=-20, ELEVON=-40 DEGS, YN=2.5, 3.5
PAGE 536

(R300:6)

AMES 87-707-CA:2 C2A

SYMBOL WACH ALPHA RUDDER PARAMETRIC VALUES
□ 2.498 3.523 20.000 .000 20.000 ELEVON RUDLER -40.000 40.000

REFERENCE INFORMATION
SRC 2.4210
REF 39.8490
SRC 39.8490
XRP 37.3000
YRP .0000
ZRP .0000
SCALE 1.000

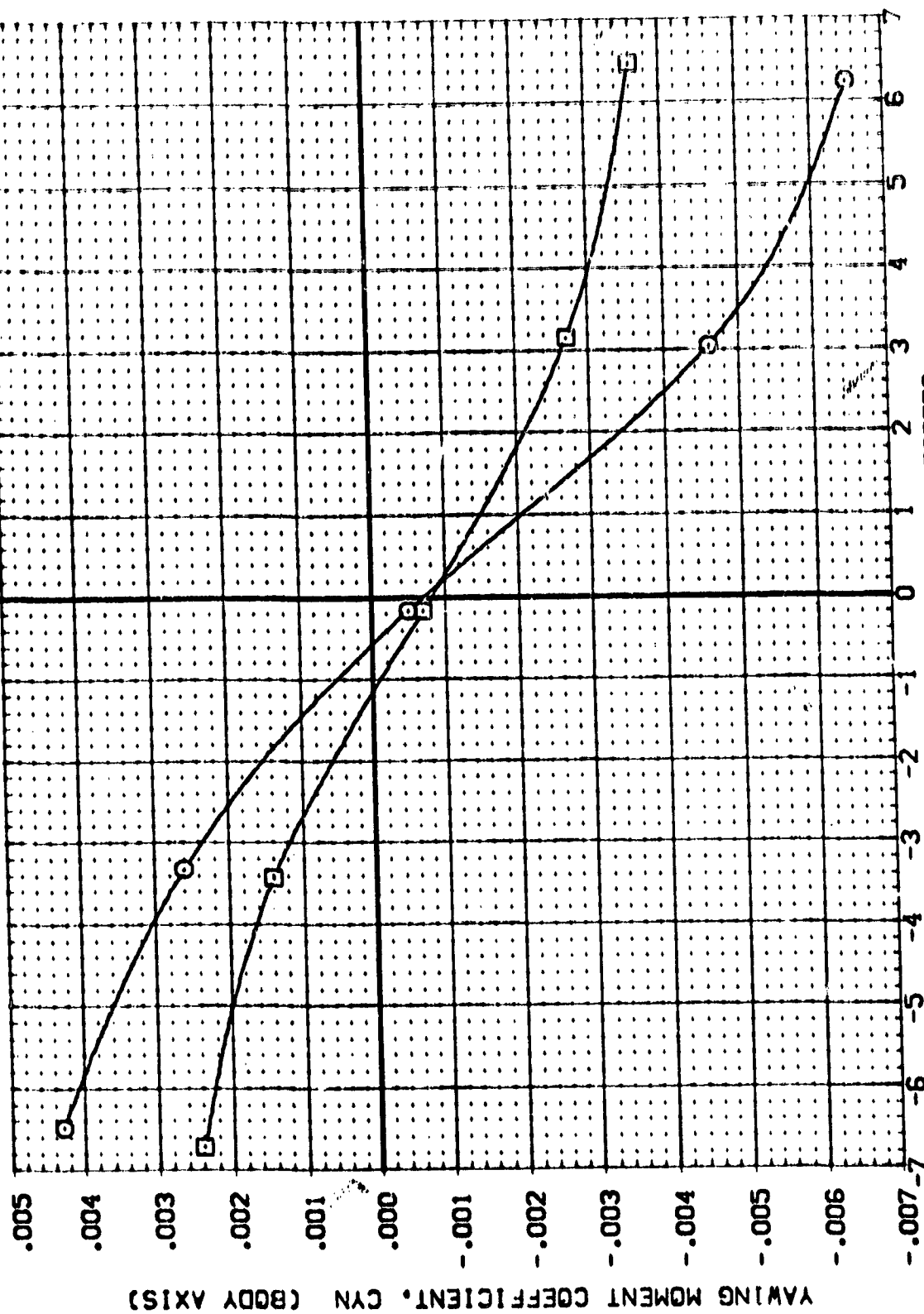


FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, YN=2.5, 3.5
PAGE 538

(R90016)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER
 2.498 20.000 ELEVON -40.000
 3.503 3.000 RUDFLR 40.000

REFERENCE INFORMATION
 SPEC 2.4210
 LREF 39.0490
 BREF 39.6450
 XREF 37.3000
 YREF 37.3000
 ZREF 37.3000
 SCALE 1.0000

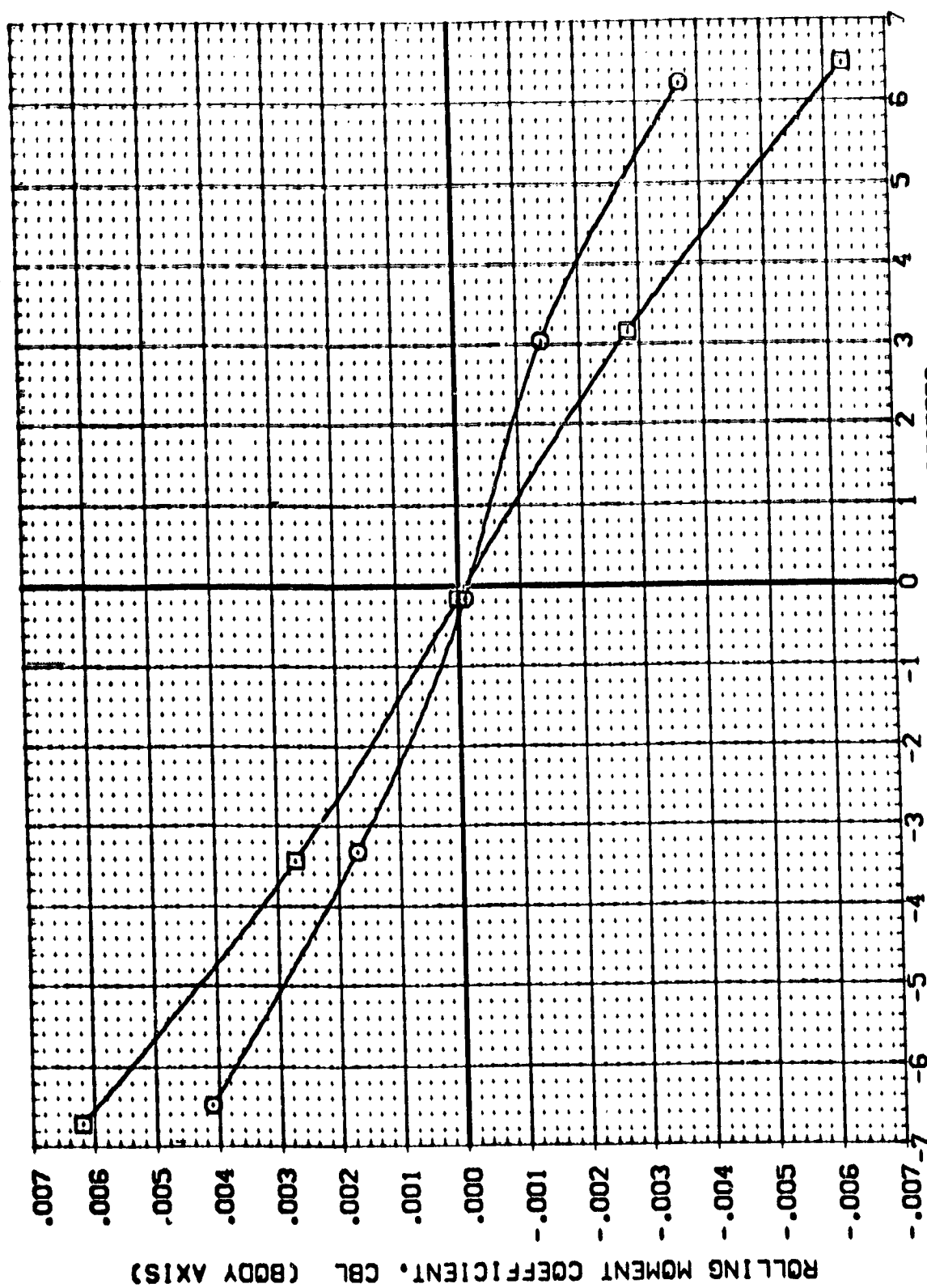


FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

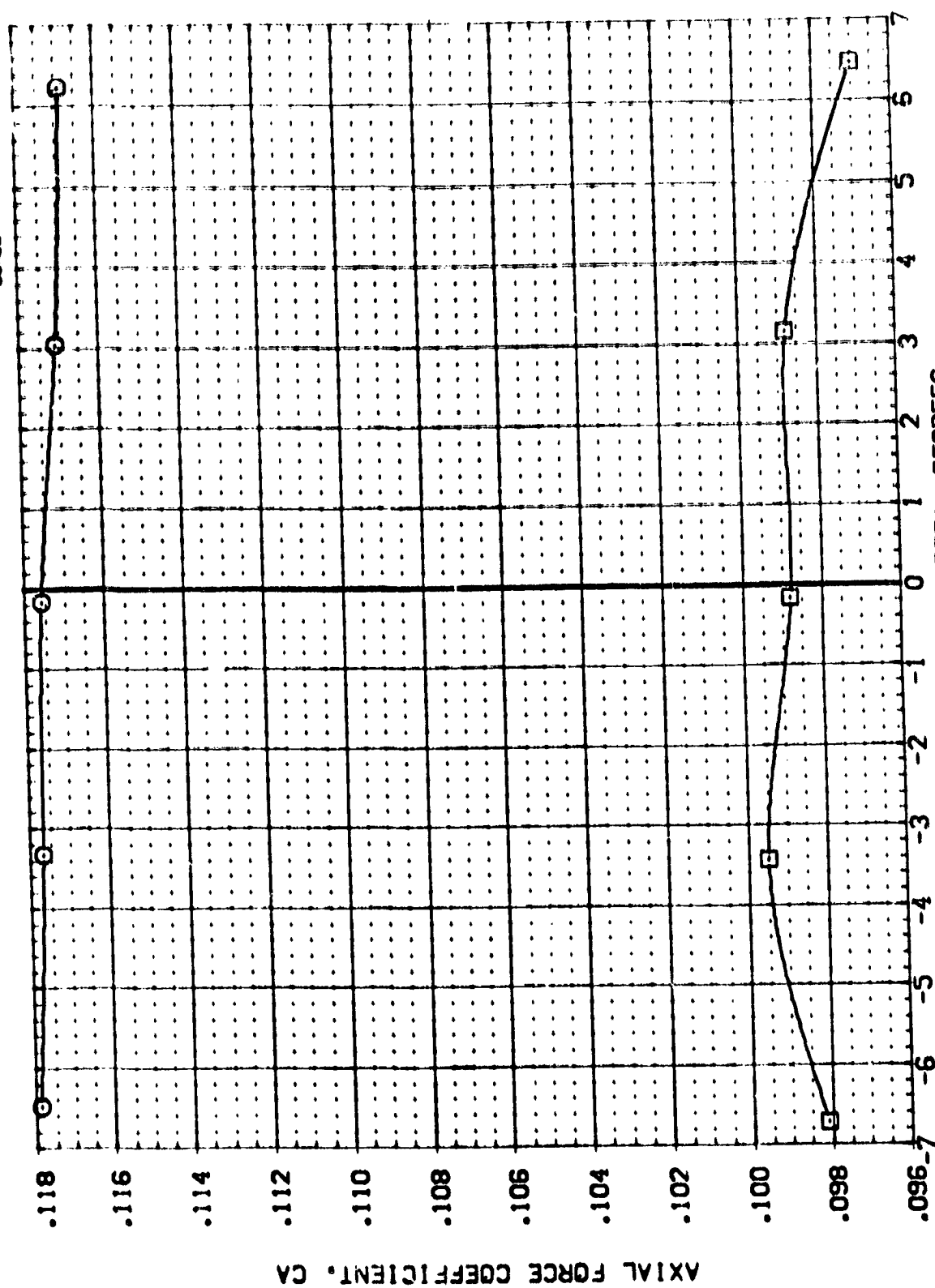
(R300:6)

AMES 87-707-0A:2 C2A

SYMBOL: 2.498 ALPHA 20.000 ELEVON -40.000
 3.503 RUDDER .000 RUDFLR 40.000

PARAMETRIC VALUES

REFERENCE INFORMATION
 SKEW 2.4212
 LIFT 38.8480
 DRAG 38.8480
 XPRD 37.3001
 YPRD 1.0000
 ZPRD 1.0000
 SCALE 1.0000



SIDESLIP ANGLE, BETA, DEGREES

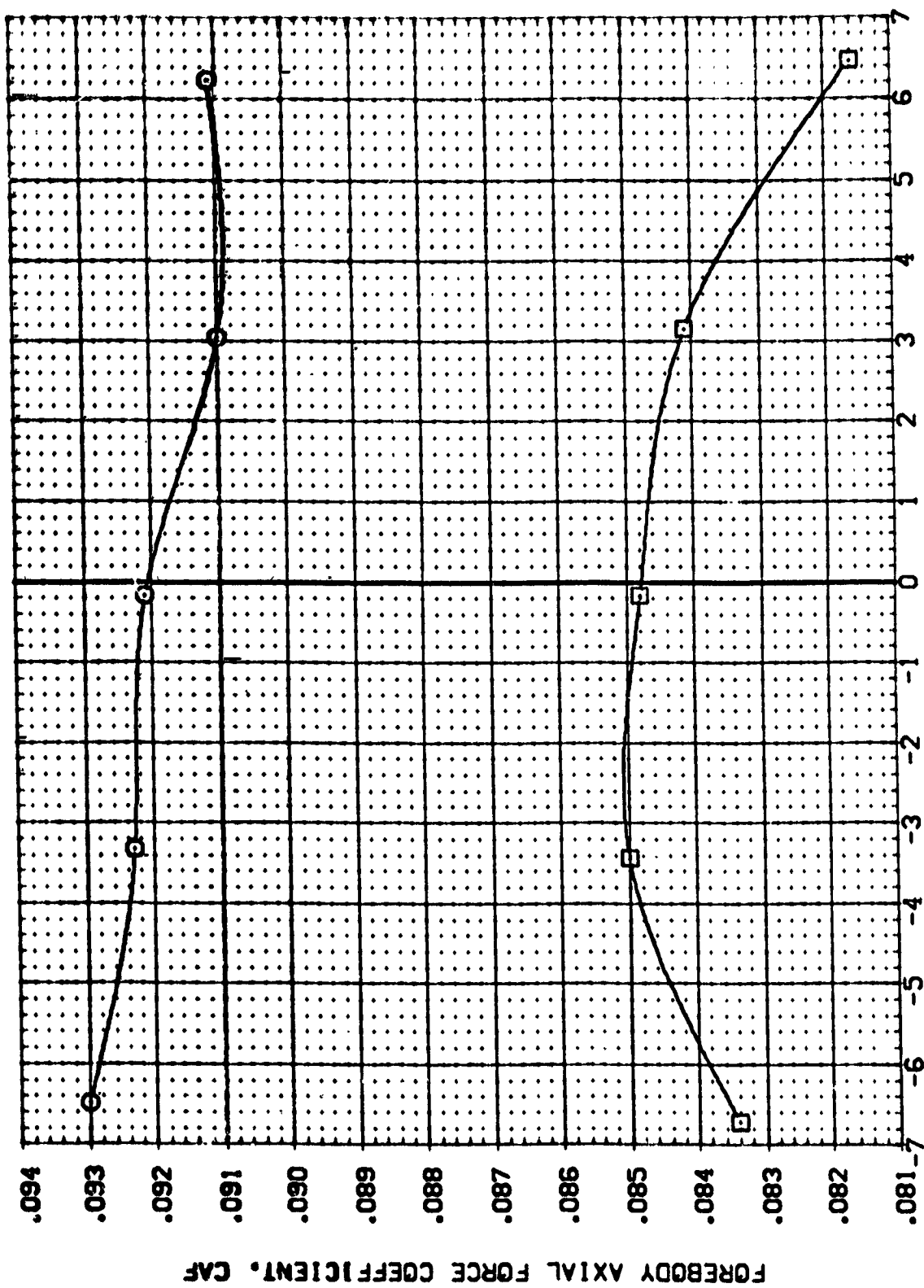
FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, VN=2.5, 3.5

(RBQ016)

AMES 87-707-0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON -40.000 RUDFLR 40.000

REFERENCE INFORMATION
SREF 2.421C SQ. FT.
LREF 39.845C IN.
BREF 39.845C IN.
VREF 32.3000 IN.
WREF .0000 IN.
ZREF .0000 IN.
SCALE .0000 IN.



SIDESLIP ANGLE, BETA, DEGREES

FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(RB0016)

AMES 87-707-0A12 02A

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0000

PARAMETRIC VALUES
 MACH 2.498
 ALPHA 20.000
 RUDDER .000
 ELEVON -40.000
 RJOFLR 40.000

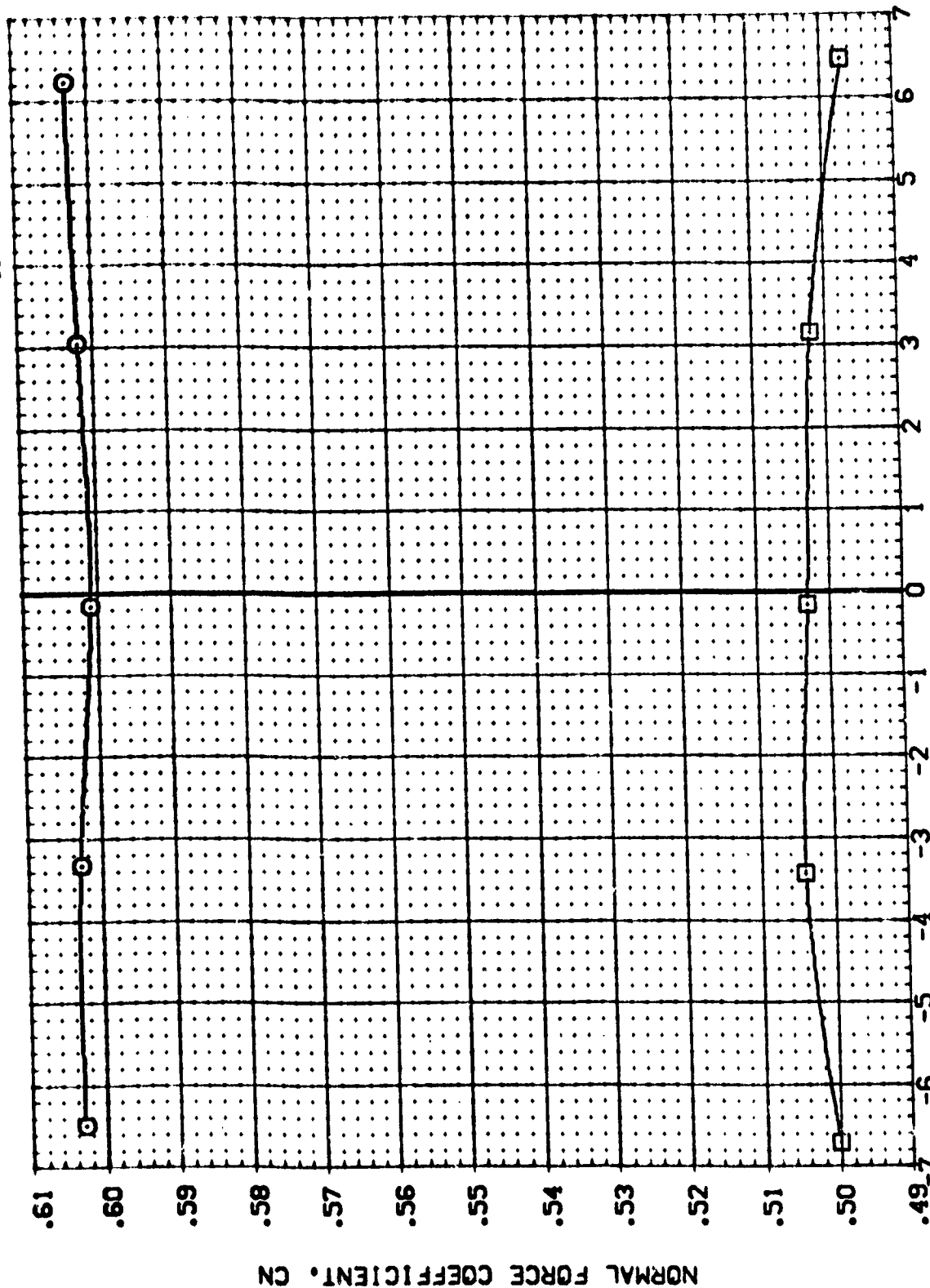
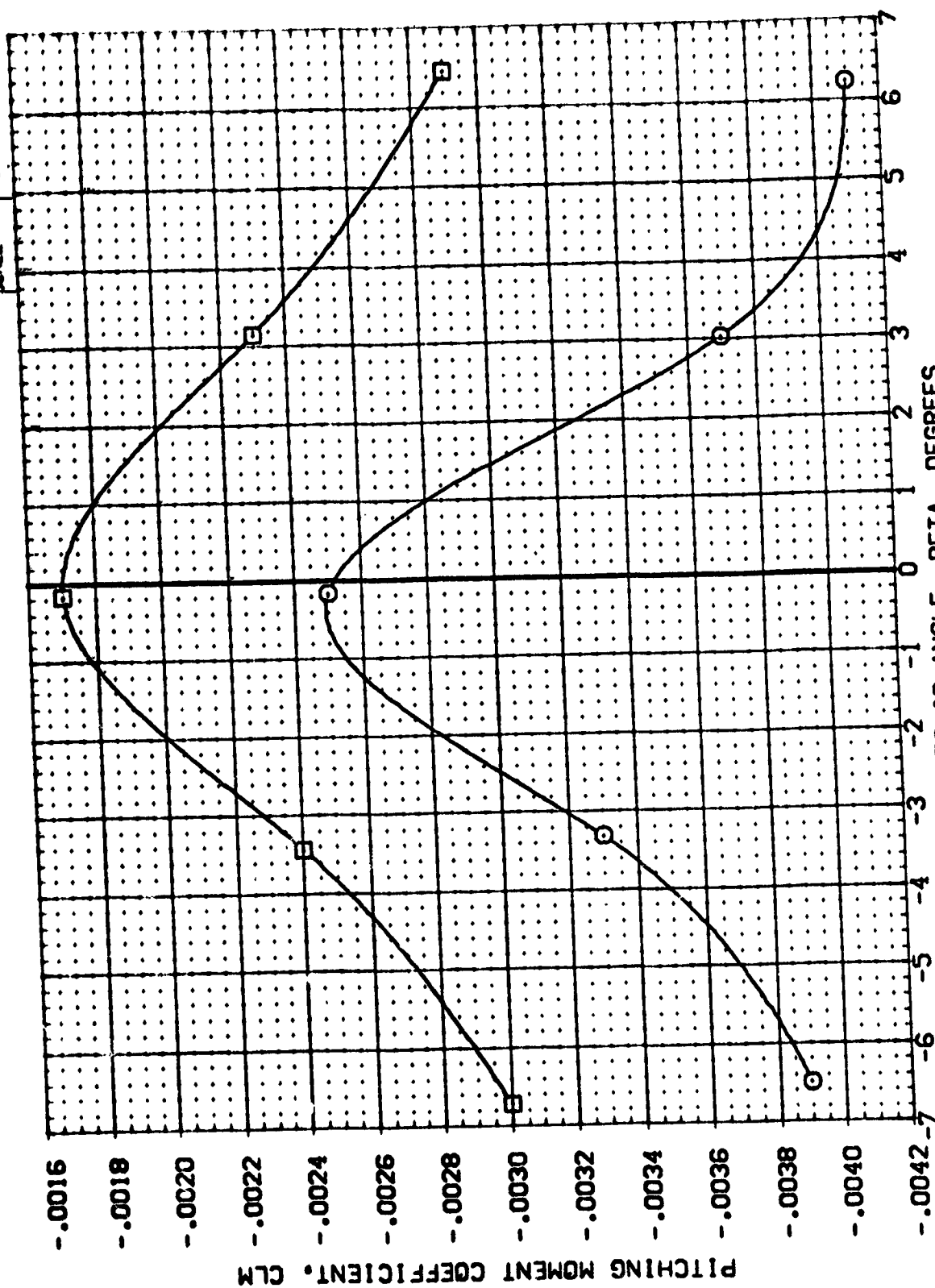


FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5
 SIDESLIP ANGLE, BETA, DEGREES
 PAGE 542

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| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.421Q |
| LEAF | 79.849C |
| SREF | 79.849C |
| CARD | 32.300C |
| CARD | .000C |
| CARD | .000C |
| CARD | .000C |
| SCALE | 3300 |

| SYMBOL | WACH | ALPHA | PARAMETRIC VALUES |
|--------|-------|-------|-------------------|
| ○ | 2.498 | 0.000 | 20,000 |
| | | | ELEVEN |
| | | | 10,000 |



0042 -7 -6 -5 -4 -3 -2 -1 0 1 2
SIDESLIP ANGLE. BETA. DEGREES

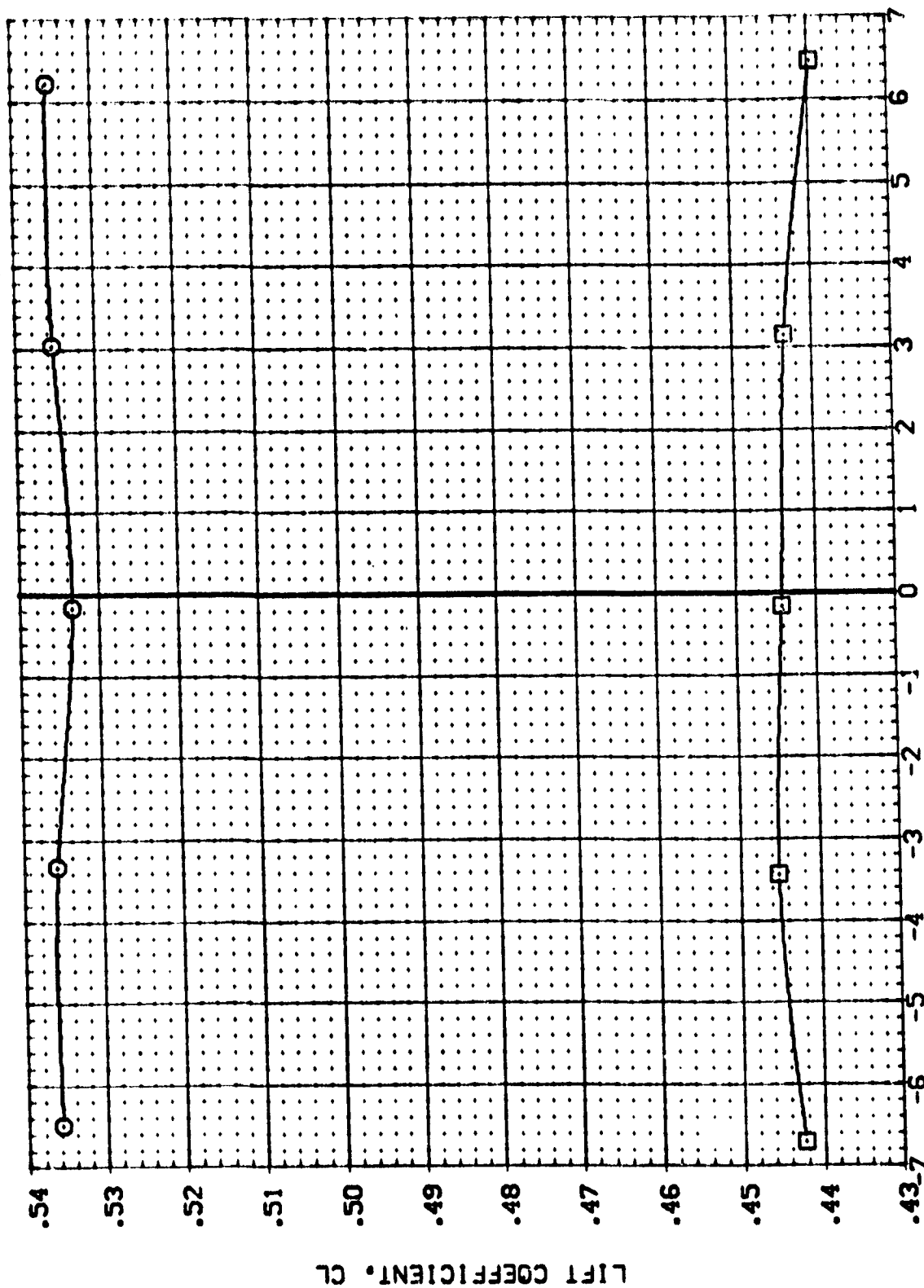
FIG. 64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS. MN=2.5, 3.5
PAGE 543

(R30016)

AMES 87-707-CA:2 02A

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 XPRD 32.3000
 YPRD .0000
 ZPRD .0000
 SCALE .0000

SYMBOL MACH ALPHA RUDDER ELEVON ROLLR
 0 2.498 3.503 .000 .000 -40.000 40.000



SIDESLIP ANGLE, BETA, DEGREES

FIG. 64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(R80016)

AMES 87-707-0A12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| | | ALPHA | ELEVON |
| ○ | 2.498 | 20.000 | -40.000 |
| □ | 3.533 | .000 | 40.000 |

REFERENCE INFORMATION

| | SC.F.T. |
|-------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XREF | 32.3000 |
| YREF | .0000 |
| ZREF | .0000 |
| SCALE | .0300 |

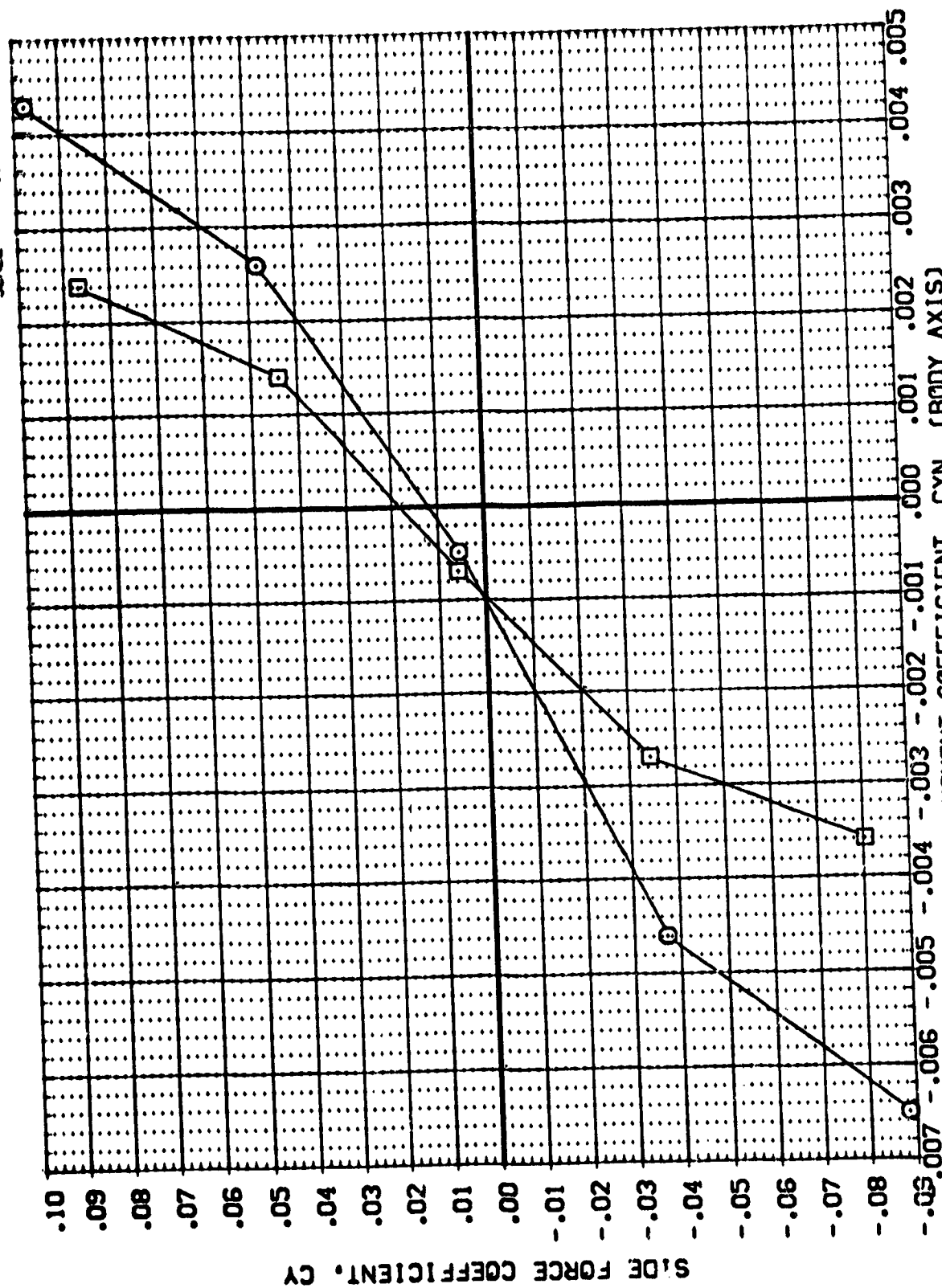


FIG.64 ORBITER LAT-DIR. AERO DATA, ALPHA=20, RUDDER=-20, ELEVON=-40 DEGS, MN=2.5, 3.5

(RB0017)

AMES 87-707-0A12 C2A

SYMBOL MACH BETA RUDDER PARAMETRIC VALUES ELEVON RUDFLR .000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 37.3000
YREF 37.3000
ZREF 37.3000
SCALE

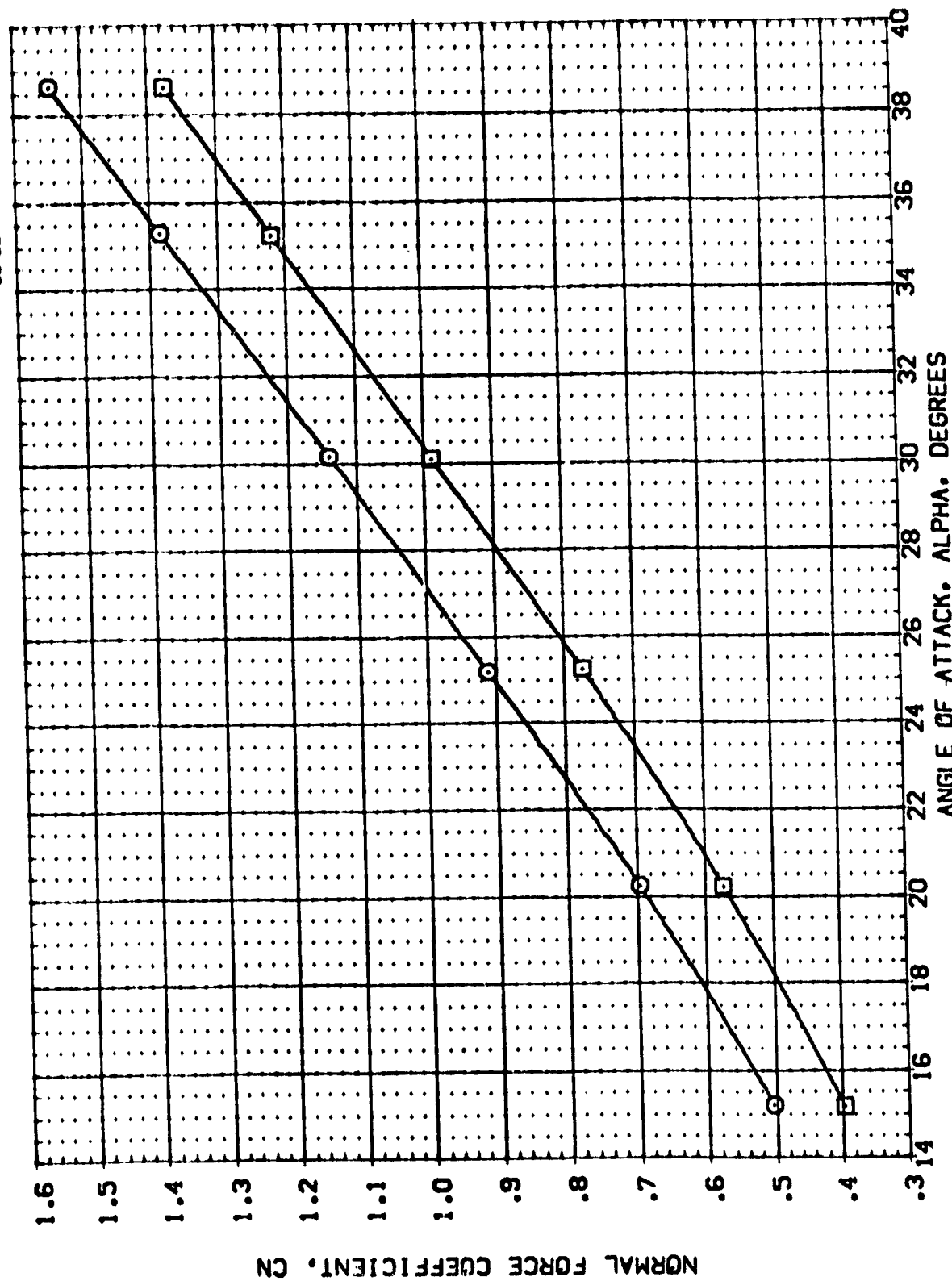


FIG.65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5, 3.5

[RBQ017]

AMES 87-707-0A12 02A

SYMBOL MAC BETA PARAMETRIC VALUES
 ○ 2.498 .000 .000 ELEVON .000
 □ 3.501 .000 .000 RUFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 29.8490
 BREF 29.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

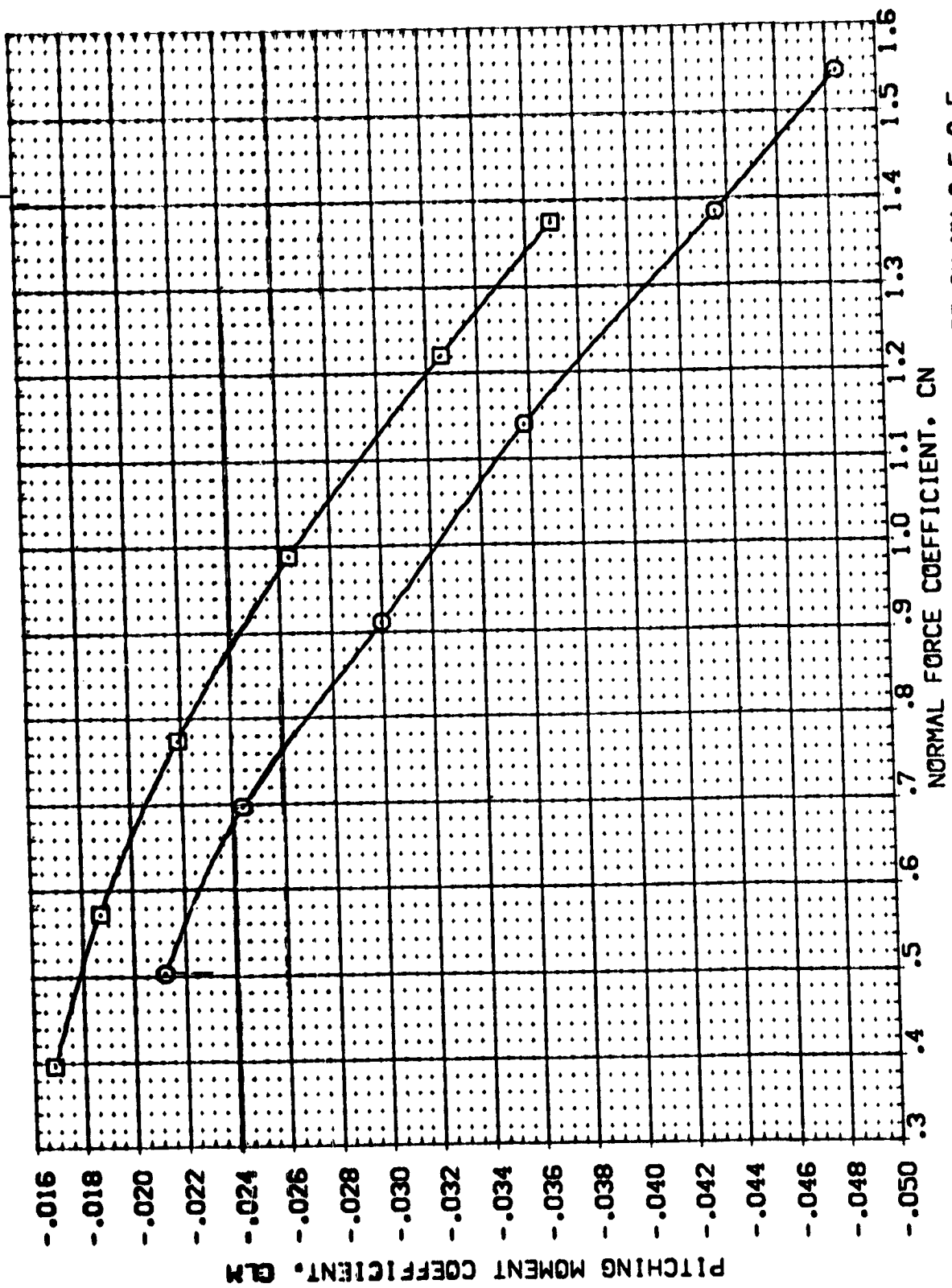


FIG.65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5,3.5

(R8Q017)

AMES 87-707-0A:2 02A

| SYMBOL | MAC | BETA | RUDER | PARAMETRIC VALUES |
|--------|-------|------|-------|-------------------|
| | 2.498 | .000 | .000 | ELEVON .000 |
| | 3.501 | .000 | .000 | RUDFLR 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.4210 | SCALE |
| LREF | 39.8450 | |
| BREF | 39.8450 | |
| XMRP | 32.3000 | |
| YMRP | .0000 | |
| ZMRP | .0000 | |
| SCALE | .0000 | |

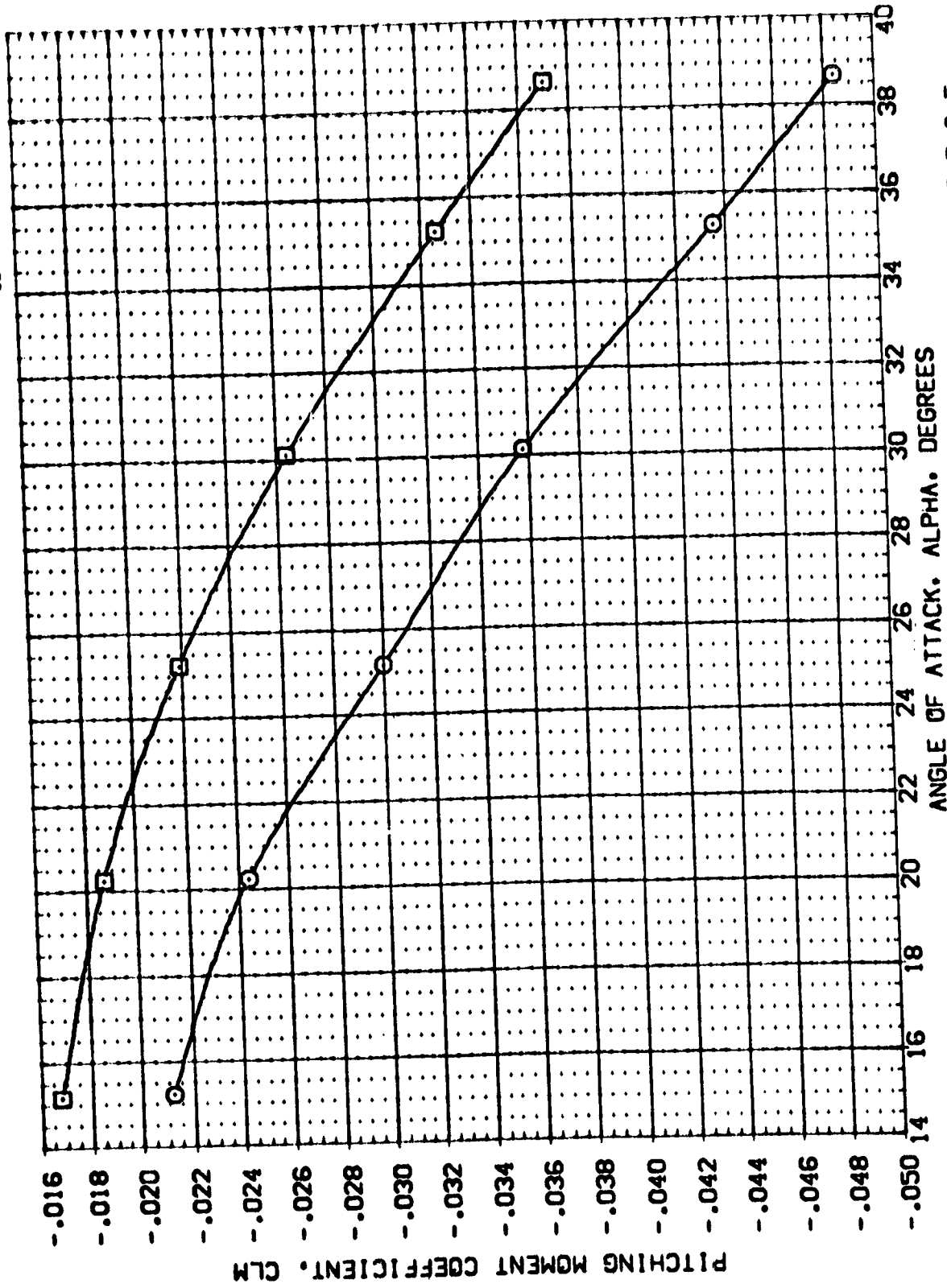


FIG.65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5,3.5

(RBQ017)

AMES 87-707-CA12 02A

SYMBOL MACH 2.498 3.501
PARAMETRIC VALUES
BETA .000 .000
ELEVON .000 .000
RUFLR 40.000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XPRP 37.3000
YPRP .0000
ZPRP .0000
SCALE .0300

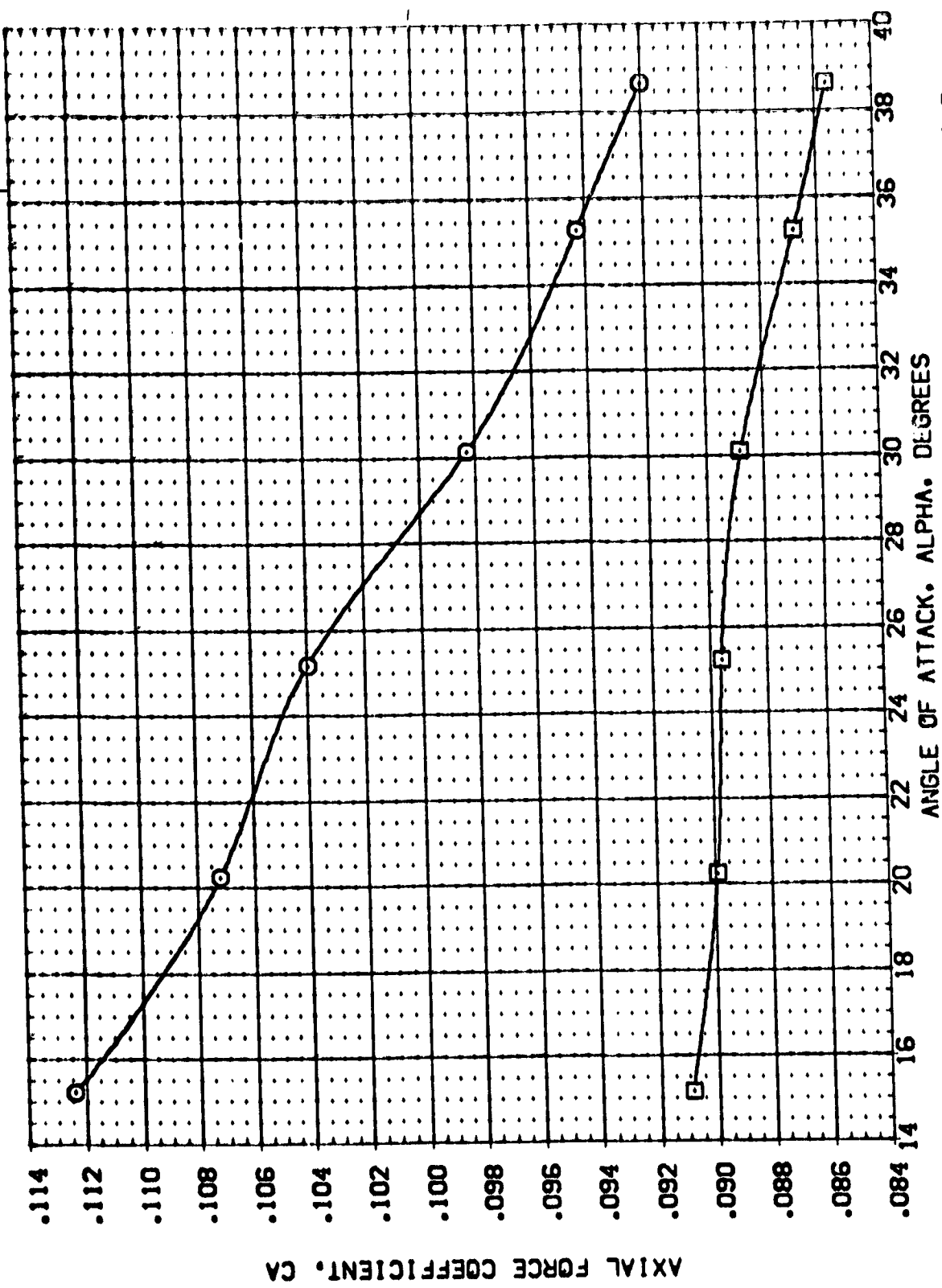


FIG.65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK.MN=2.5,3.5

AMES 87-707-0A:2 02A

[illegible]

| SYMBOL | MACRO | BETA | PARAMETRIC VALUES |
|--------|-------|------|-------------------|
| OL | 2.498 | .000 | ELEVON .000 |
| | 3.501 | .000 | RJ5FLR 40.000 |

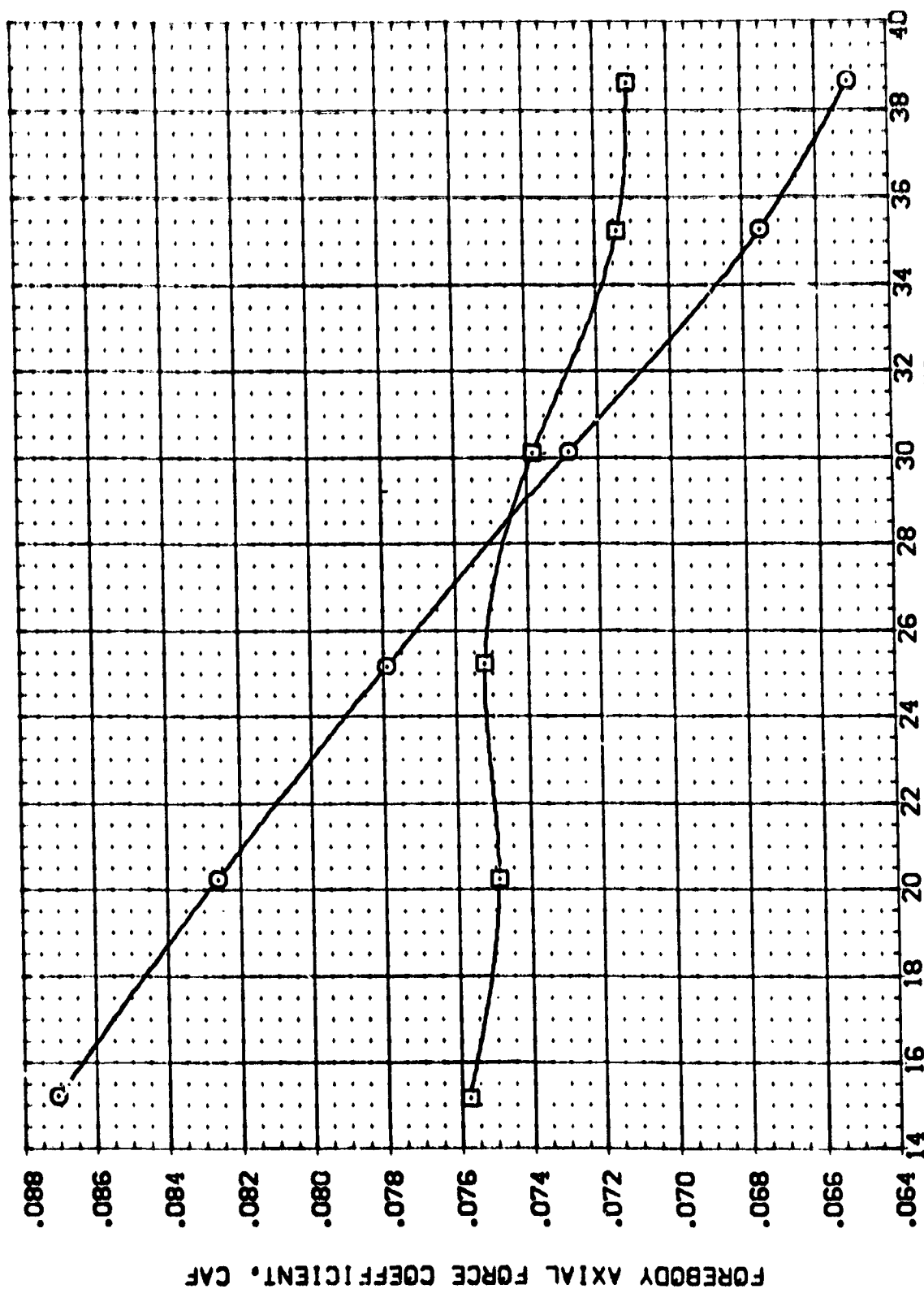


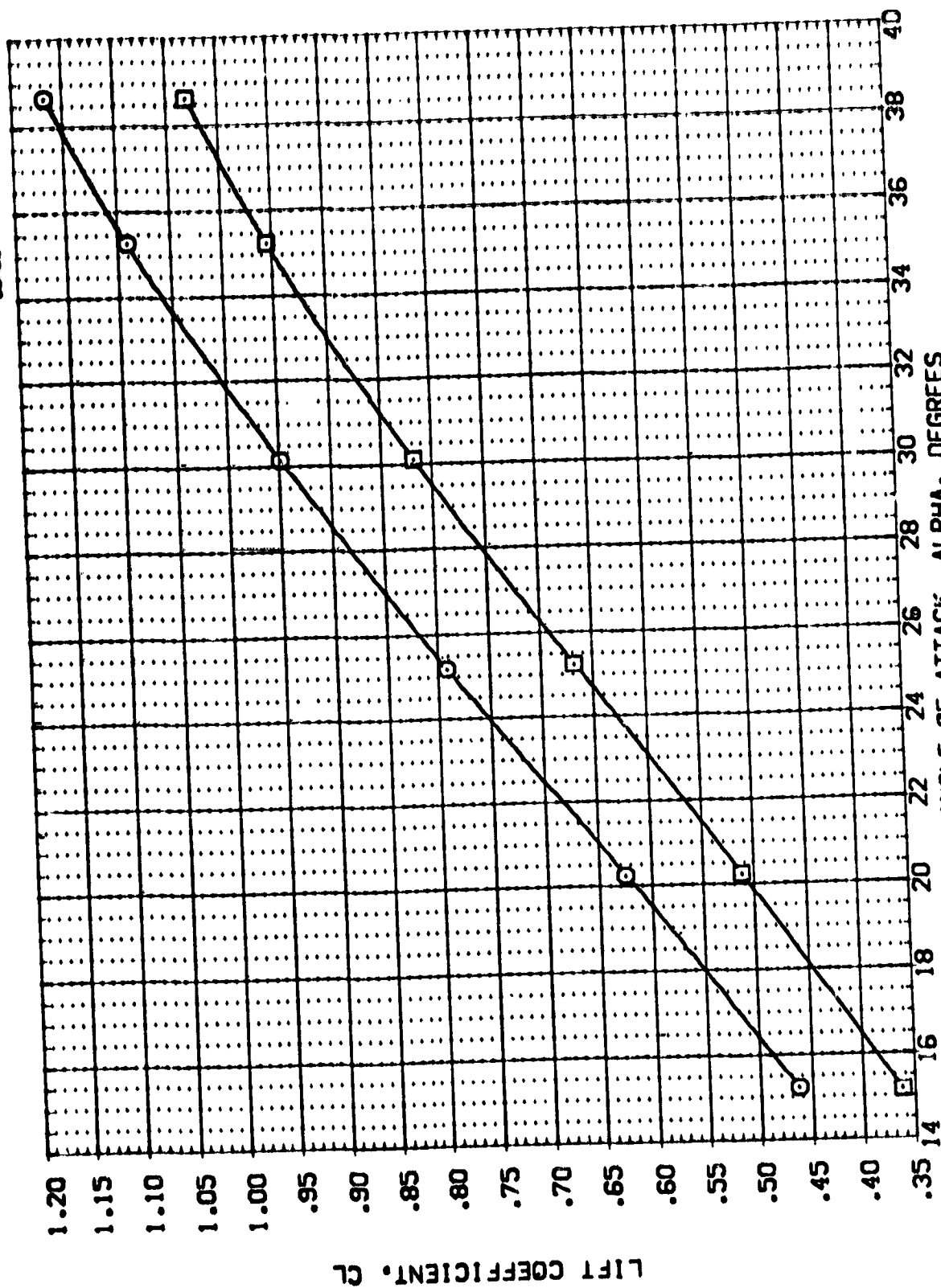
FIG. 65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5, 3.5

AMES 87-707-QA12 C2A

| SYMBOL | PARAMETRIC VALUES | UNIT |
|--------|-------------------|--------|
| MACH | BETA | .000 |
| 2.498 | ELEVON | .000 |
| 3.501 | ROD FLR | 40.000 |

| | |
|-------|---------|
| SREF | 2.42:0 |
| LREF | 78.0496 |
| BREF | 78.0496 |
| XREF | 32.3000 |
| YREF | 32.3000 |
| ZREF | 32.3000 |
| SCALE | 32.3000 |

REFERENCE INFORMATION
S.F.T.



22 24 26 28 30
ANGLE OF ATTACK. ALPHA. DEGREES

FIG. 65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5, 3.5

(R88017)

AMES 87-707-CA12 C2A

SYMBOL MACH BETA RUDER PARAMETRIC VALUES ELEVON RUDER 40,000 .000 .000 .000

REFERENCE INFORMATION
SFC 2.4212
LREF 38.9180
SREF 38.8180
XREF 32.3000
YREF 0.0000
SCALE 0.0000

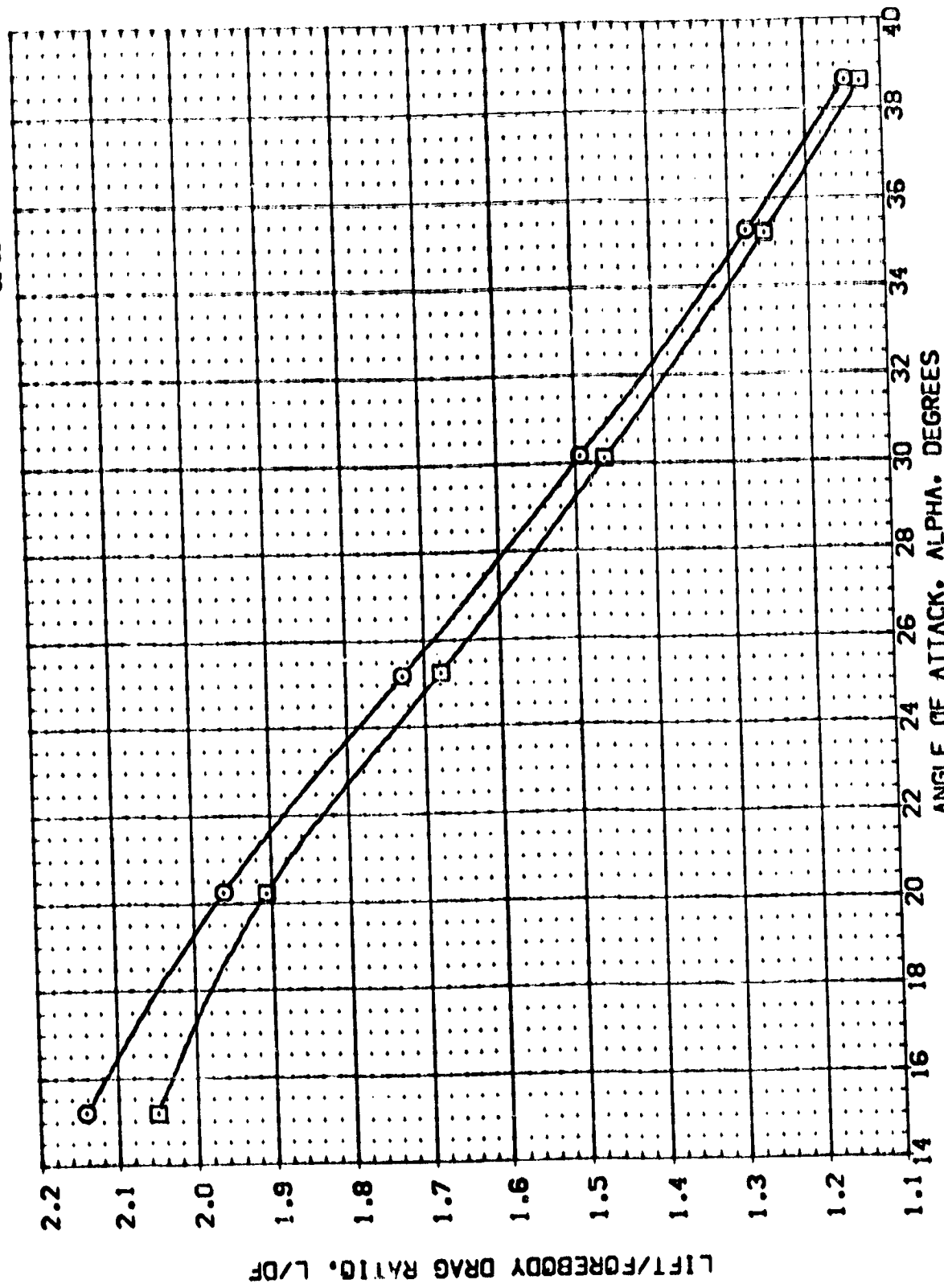


FIG.65 ORBITER LONGITUDINAL AERO. DATA AT HIGH ANGLES OF ATTACK, MN=2.5,3.5

(R80018)

AMES 87-707-GA12 32A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES
 2.498 30.000 ELEVON .000
 3.501 30.000 RUDER 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 30.0490
 BREF 30.0490
 XREF 32.0000
 YREF 1.0000
 ZREF 1.0000
 SCALE 1.0000

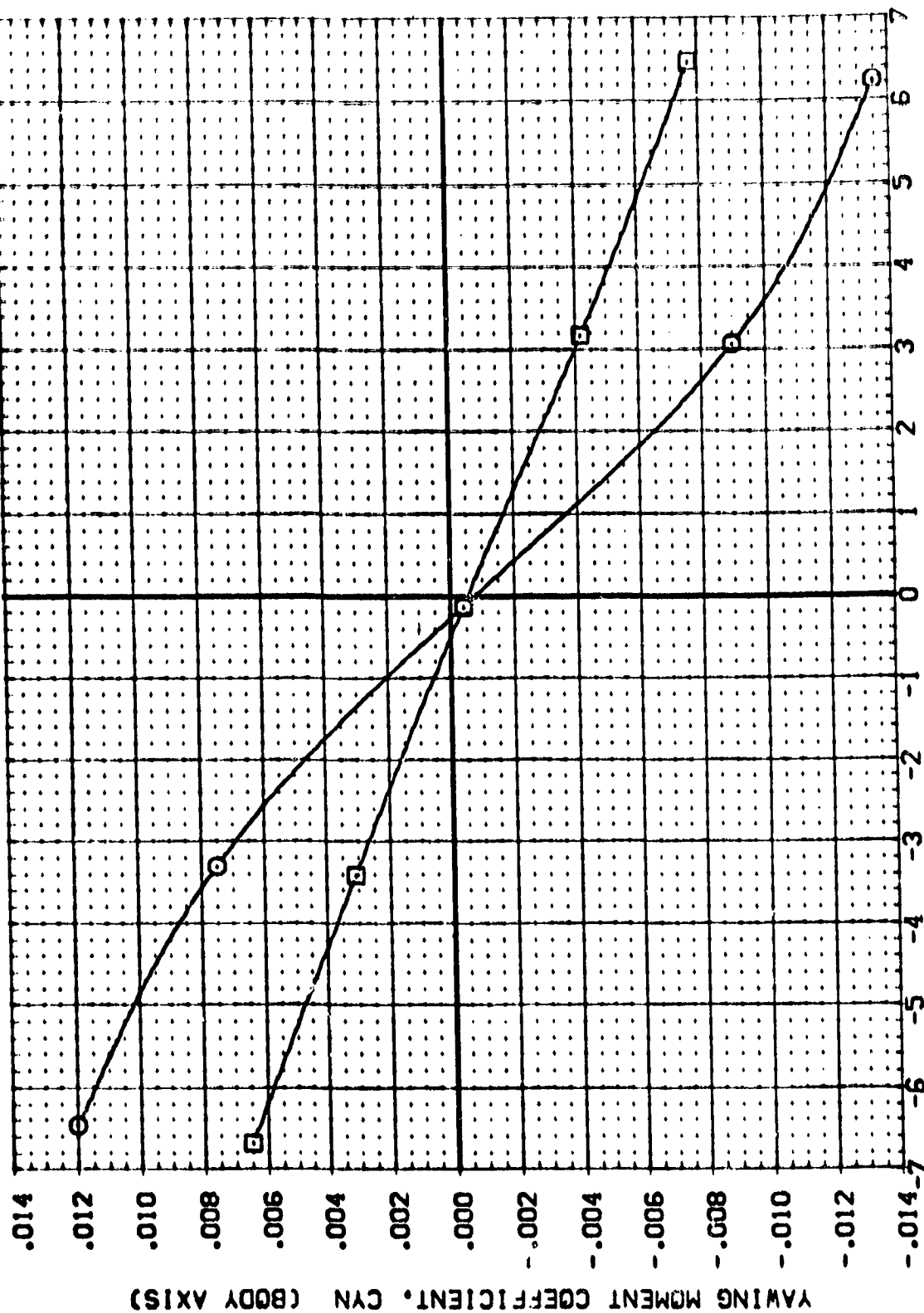


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5,3.5
 SIDESLIP ANGLE, BETA, DEGREES

(RB00018)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER
2.498
3.500
30.000
.000
ELEVON
RUDFLR
.000
40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
UREF 39.8450
XGRP 32.0000
YGRP .0000
ZGRP .0000
SCALE .0300

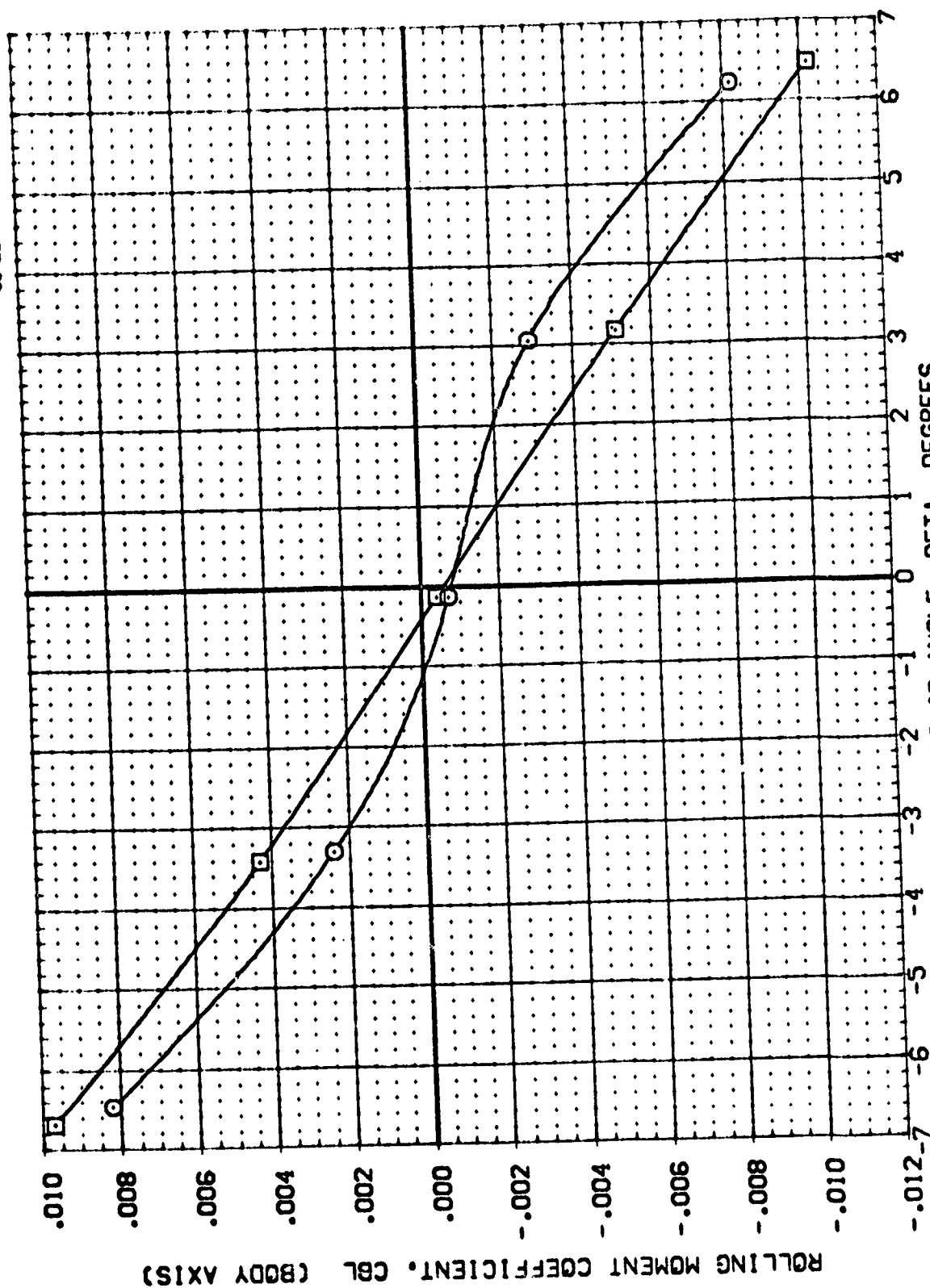


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5, 3.5

(RBG018)

AVES 87-707-0A12 02A

SYMBOL WICH ALPHA RUDER PARAME'RIC VALUES
 100 2.498 3.501 30.000 .000 30.000 ELEVON .000
 3.501 3.501 .000 RUDLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 YREF 32.3000
 XREF .0000
 ZREF .0000
 SCALE .0300



FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5,3.5

(R80018)

AVES 87-707-0A12 02A

| SYMBOL | | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| □ | 2.498 | ALPHA | 30.000 |
| ○ | 3.501 | R-000R | .000 |
| | | ELEVON | 40.000 |
| | | R-00FLR | .000 |

REFERENCE INFORMATION

| SPREF | 2.4210 | SC.FT. |
|-------|---------|--------|
| LREF | 39.8490 | |
| BREF | 39.8490 | |
| WREF | 32.3000 | |
| YREF | .0000 | |
| ZREF | .0000 | |
| SCALE | .0000 | |

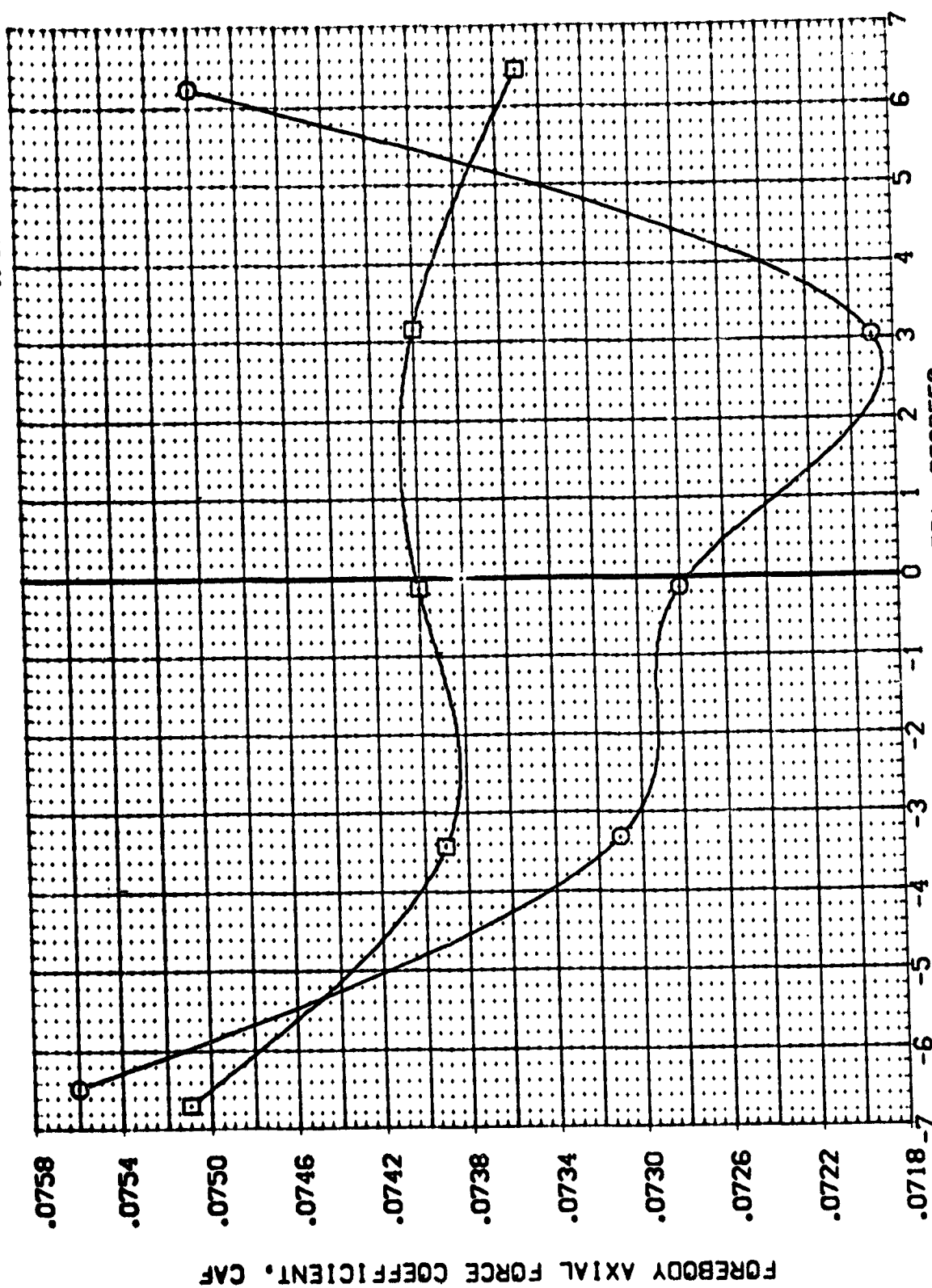


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5,3.5

(RB0018)

AMES 87-707-CA:2 C2A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES
 110 2.498 30.000 .000 40.000
 3.501 .000 RUDFLR

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 XMRD 37.3000
 YMRD .0000
 ZMRD .0000
 SCALE .0300

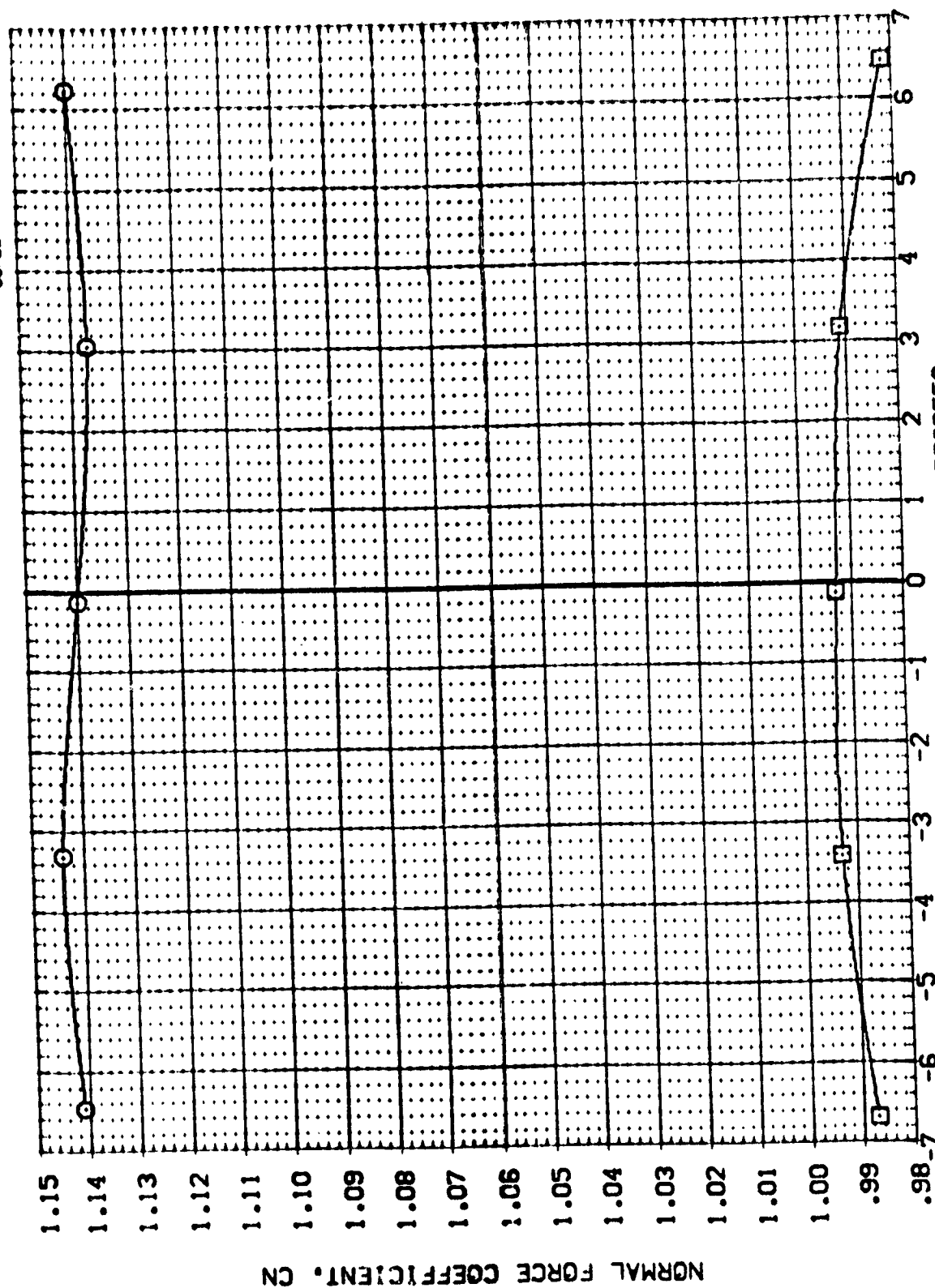


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5,3.5
 SIDESLIP ANGLE, BETA, DEGREES

(R80018)

AVES 87-707-CA12 02A

SYMBOL 110
WACH 2.498
ALPHA 30.000
RUDDER .000
ELEVON 40.000
RUDFLR .000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRP 37.3000
YPRP .0000
ZPRP .0000
SCALE .0300

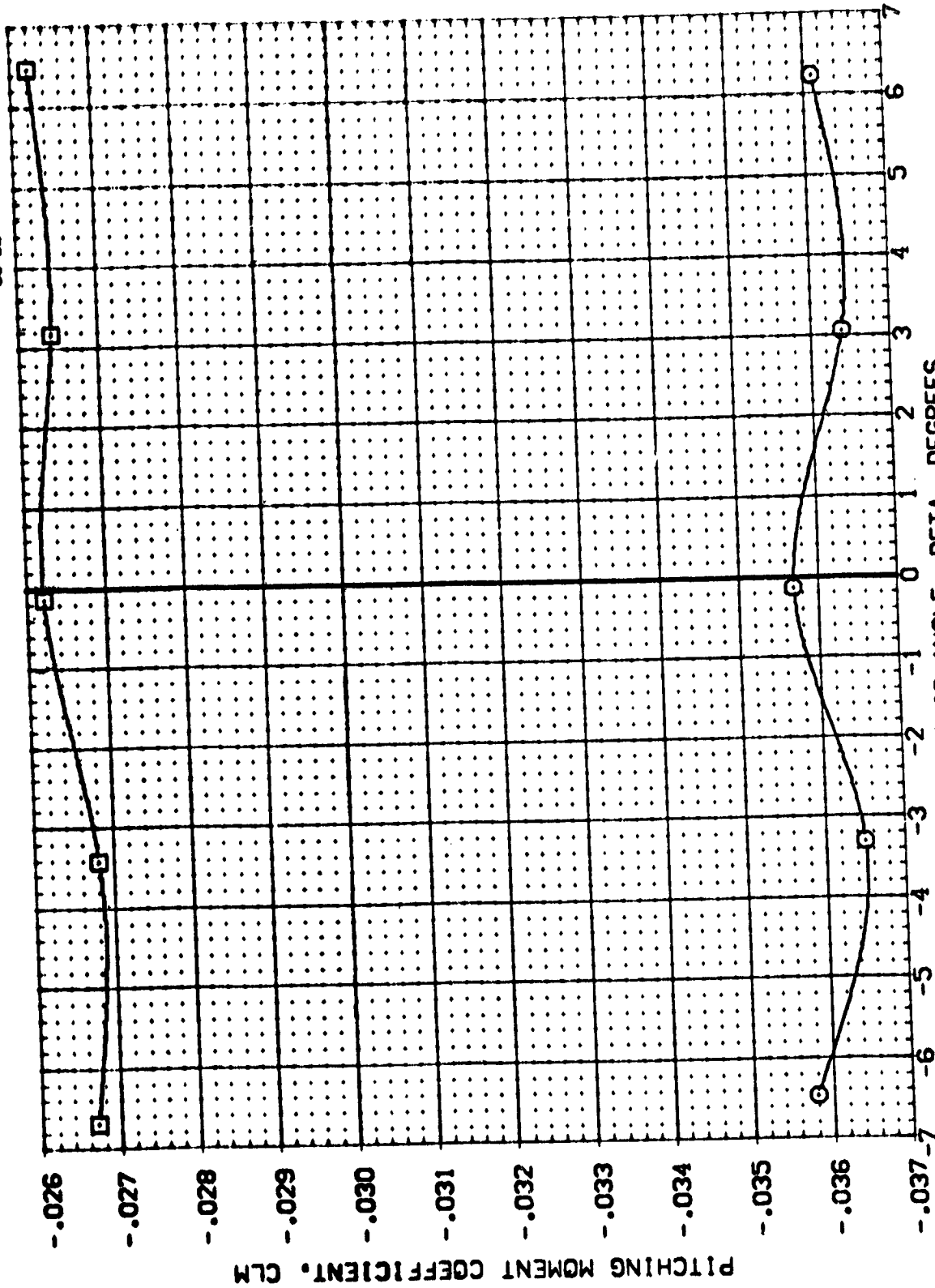


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS.,MN=2.5,3.5

(R30018)

AVES 87-707-CA12 C2A

SYMBOL WAC-1
2.498
3.50: ALPHA
30.000 ELEVON
.000 RUDDER
40.000

REFERENCE INFORMATION
SREF 2.4210
REF 39.9490
BREF 39.8490
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE

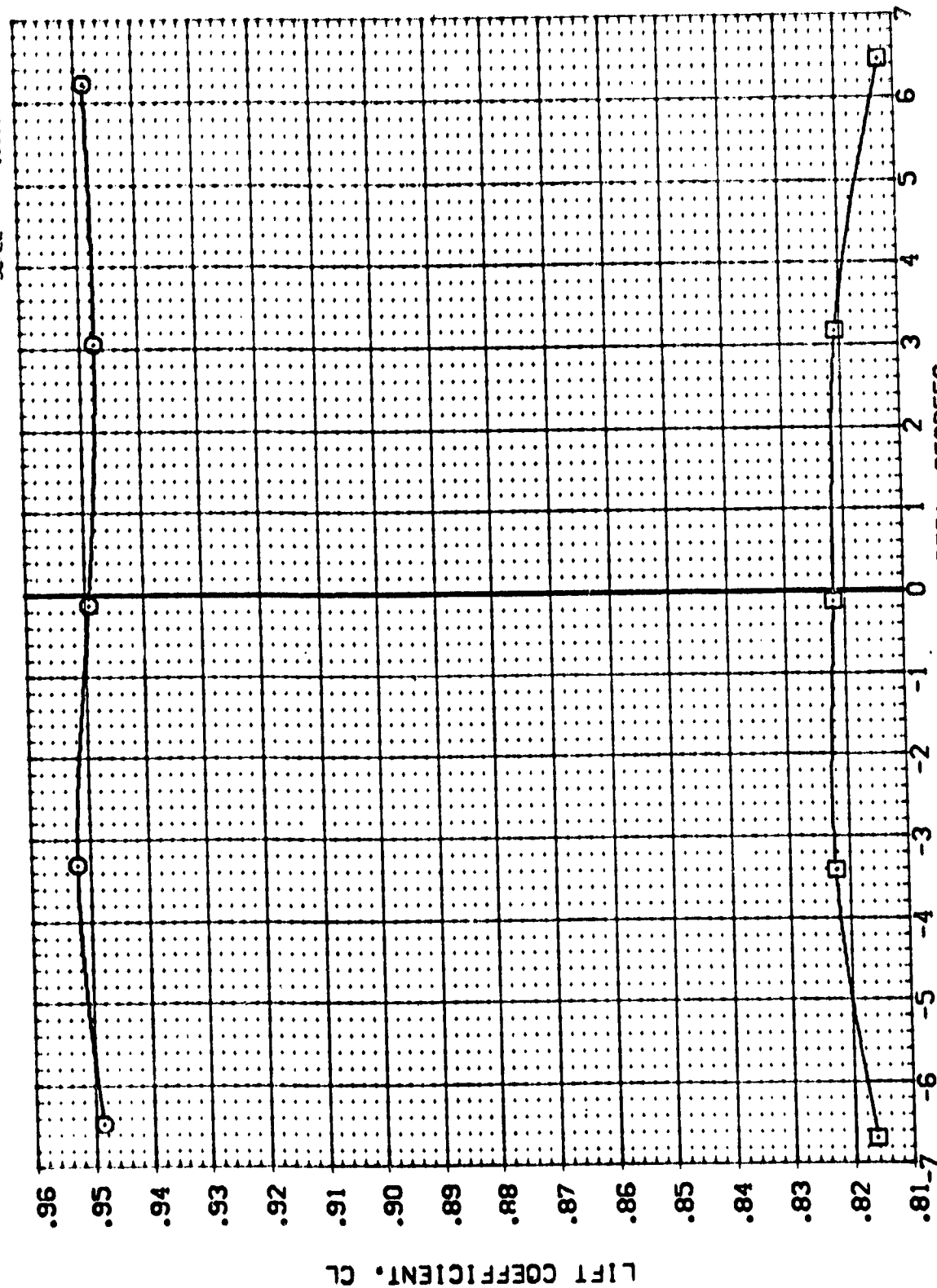


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS.,MN=2.5,3.5

[RB0018]

AMES 87-707-CA12 02A

| | | | |
|--------|-------|-------------------|---------|
| SYMBOL | MACH | PARAMETRIC VALUES | |
| | | ALPHA | ELEVON |
| □ | 3.501 | 30.000 | .000 |
| ○ | 2.498 | .000 | 40.000 |
| | | R-DOER | R-DOFLR |

REFERENCE INFORMATION
 SREF 2.4210
 LREF 29.8450
 BREF 29.8450
 XREF 32.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE .0300

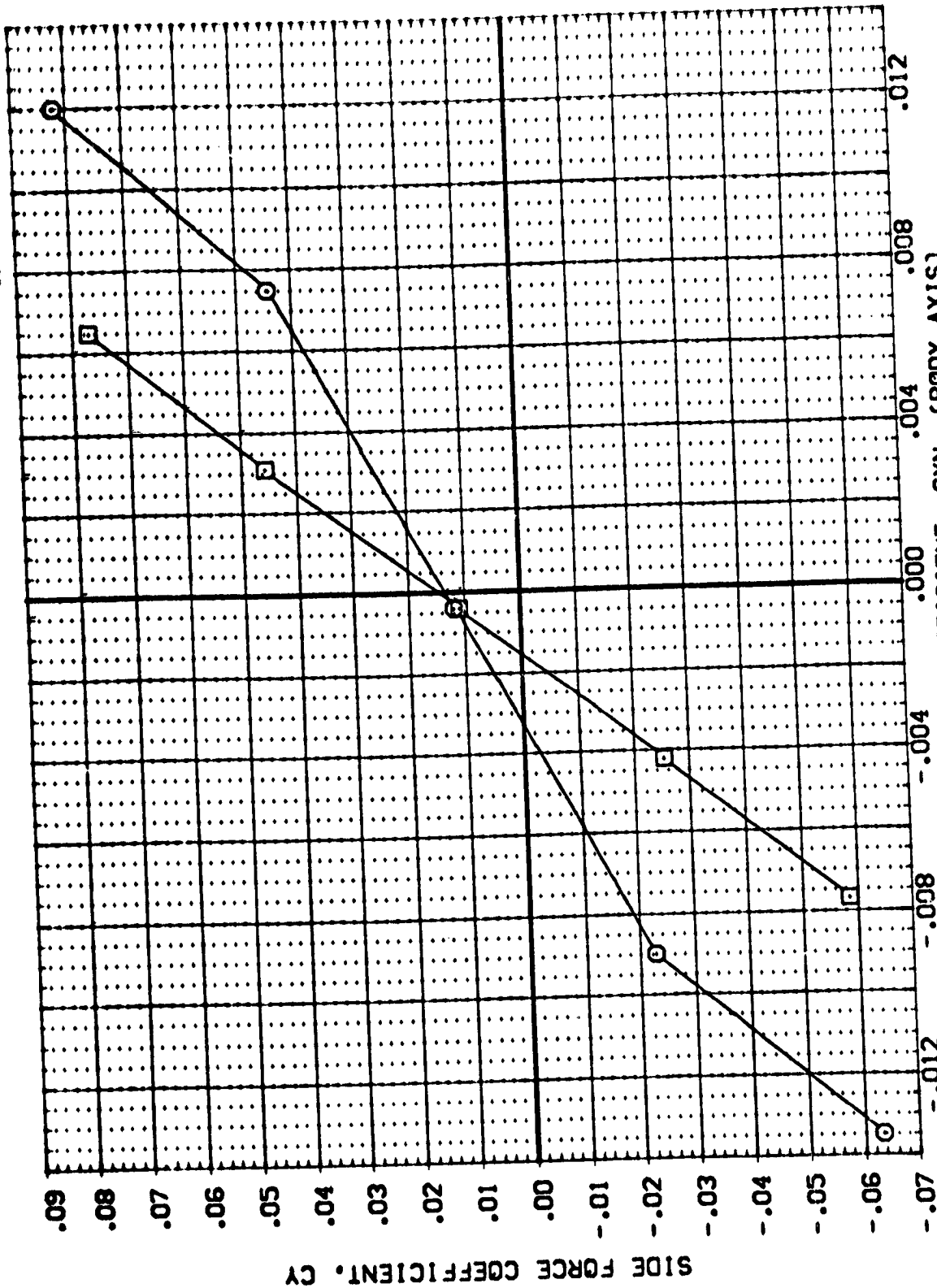


FIG.66 ORBITER LAT-DIR. AERO DATA ALPHA=30 DEGS., MN=2.5,3.5
 YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

(R80019)

AVES 87-707-CA:2 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON RUDDLR .000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 32.8490
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE 1.500

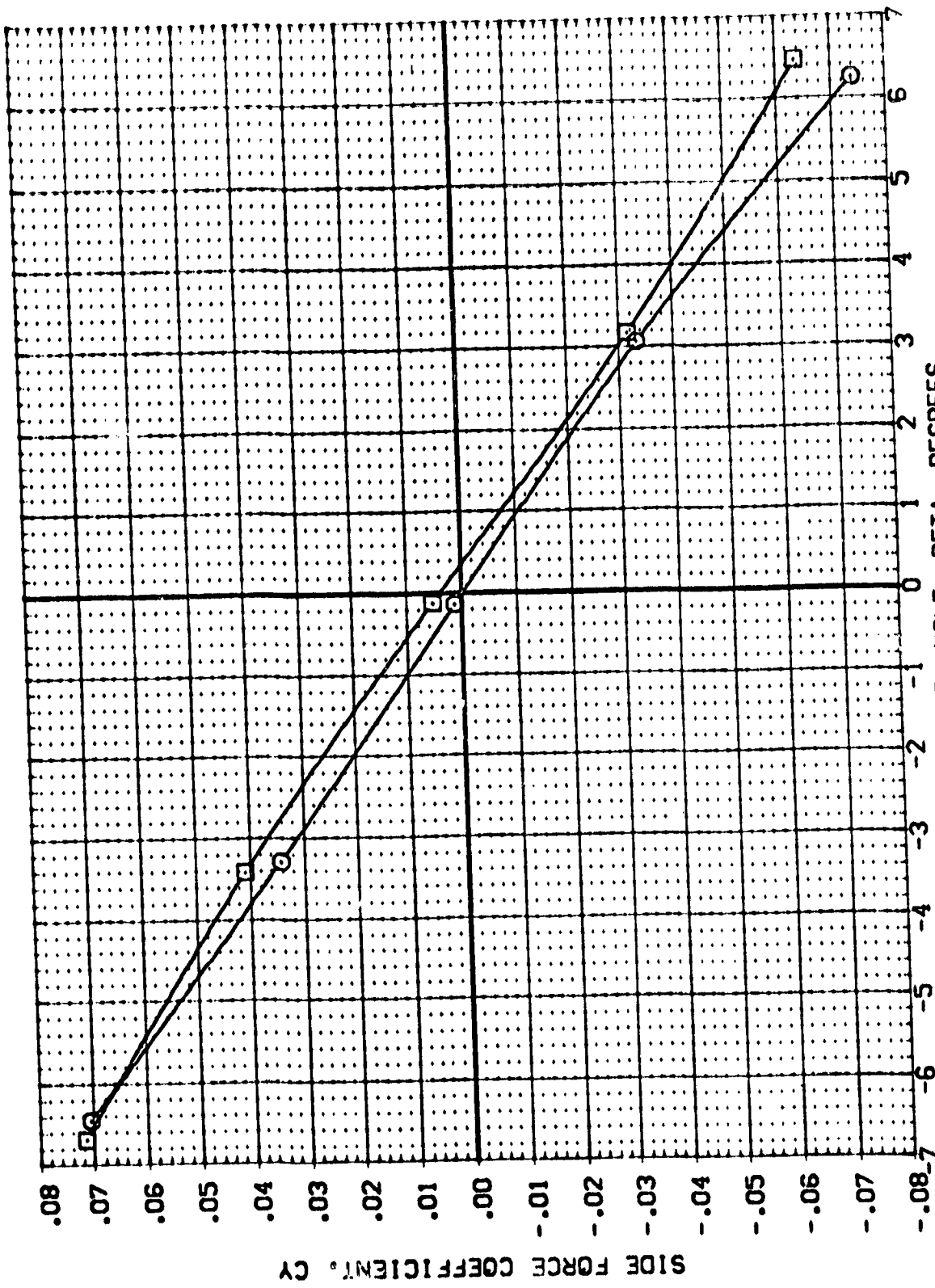


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5, 3.5

AMES 87-707-CA:2 C2A

| SYMBOL | WACH | ALPHA | BORDER | ROJELR | ELEVEN | PARAMETRIC VALUES |
|--------|-------|-------|--------|--------|---------|-------------------|
| SYMBOL | 2.498 | | | | 30.000 | .000 |
| | 2.502 | | | | -20.000 | 40.000 |

| REF. | REFERENCE INFORMATION | SCALE |
|-------|-----------------------|-------|
| SREF | 2 4210 | |
| REF | 32 8450 | |
| REF | 32 8450 | |
| XREF | 32 3000 | |
| YREF | 32 3000 | |
| ZREF | 32 3000 | |
| SCALE | 32 3000 | |

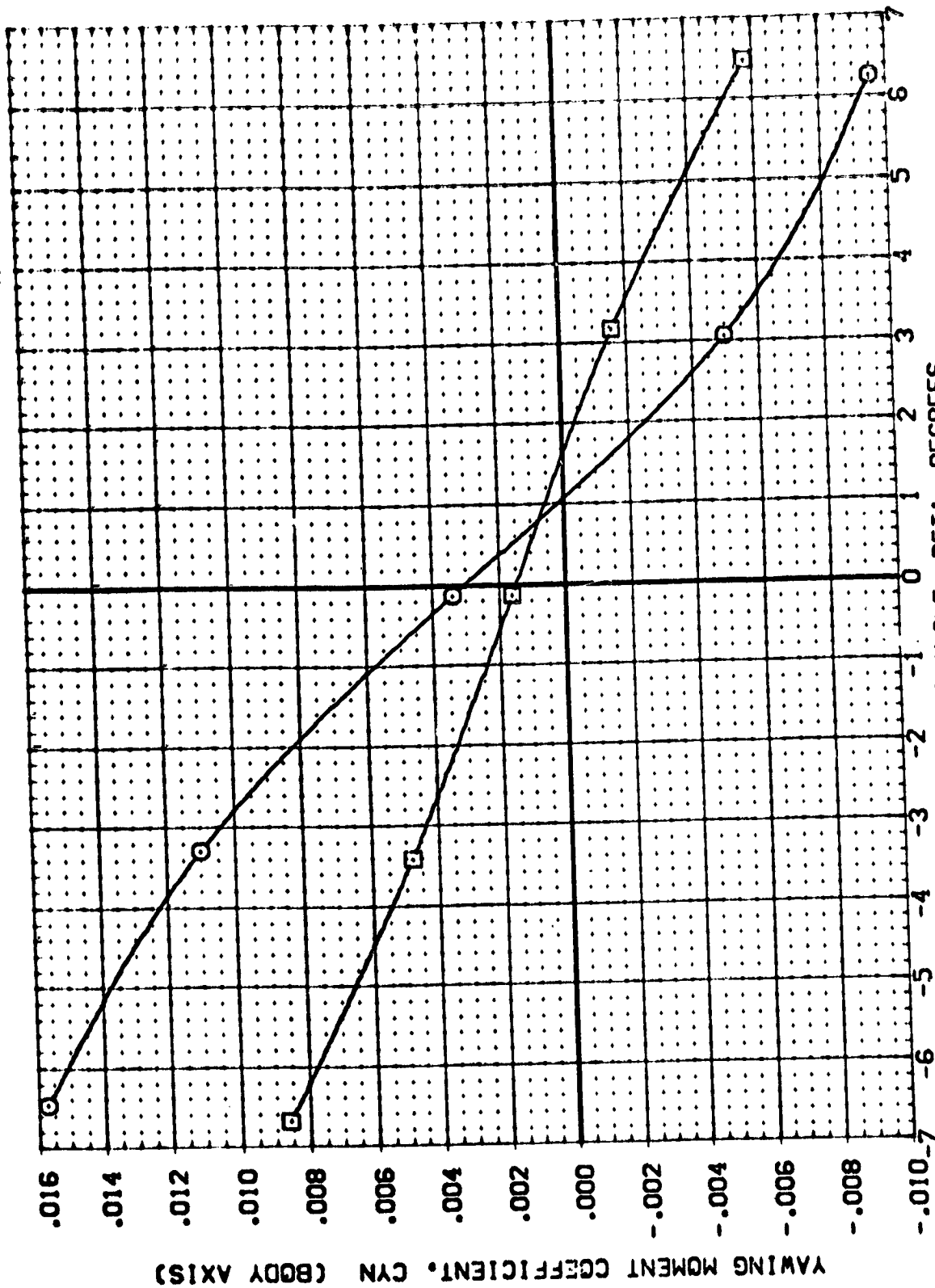


FIG. 67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5, 3.5

(R80019)

AMES 87-707-CA12 C2A

SYMBOL MAC-
2.498
3.502
ALPHA
RUDER
PARAMETRIC VALUES
30.000
-20.000
ELEVON
RUDER
40.000
ELEVON

REFERENCE INFORMATION:
SREF 2.4210
LREF 39.8490
SREF 39.8490
XREF 37.3000
YREF 0.0000
ZREF 0.0000
SCALE 0.0000

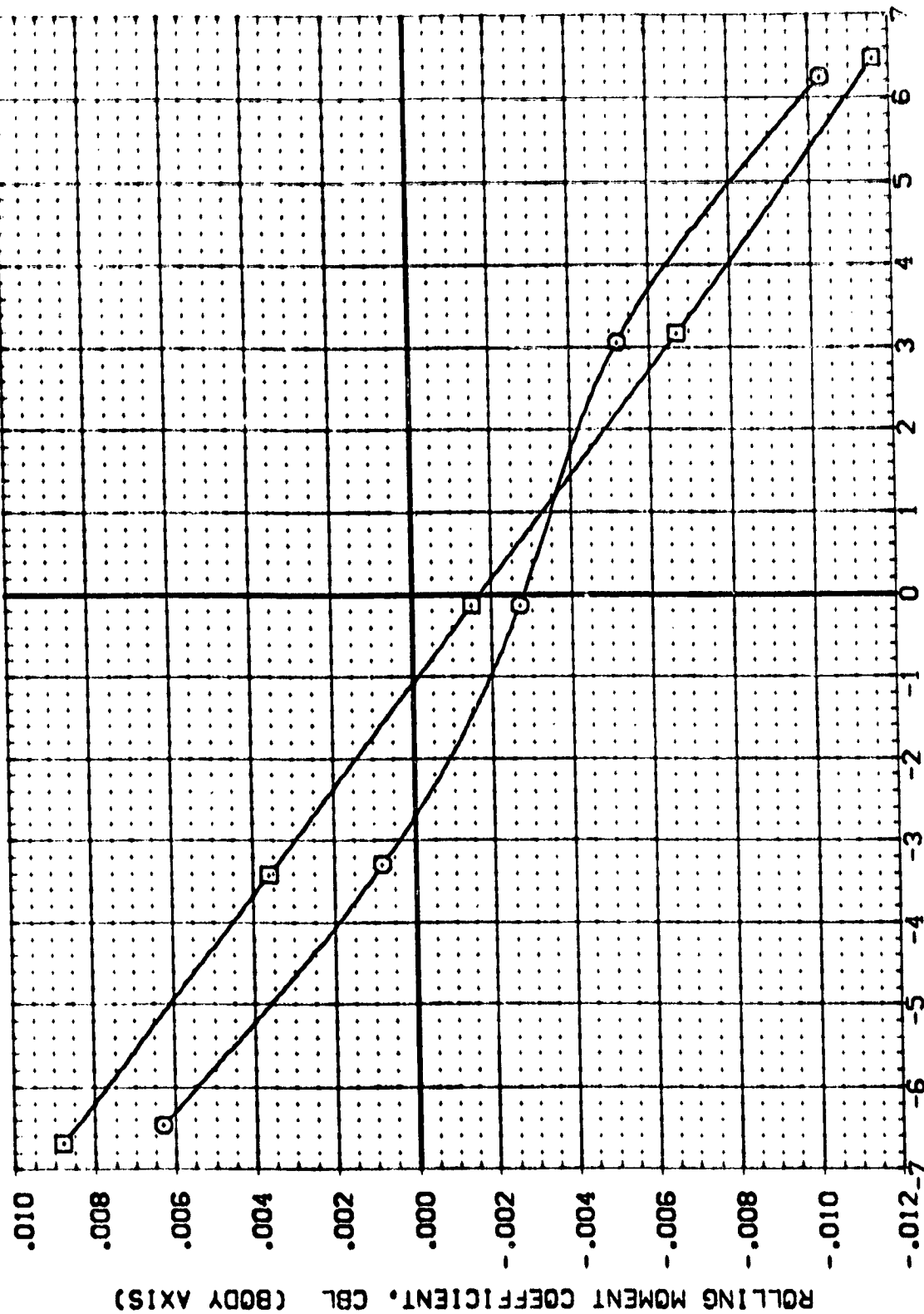


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5, 3.5

(R80019)

AMES 87-707-CA12 02A

| SYMBOL | MACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|---------|
| ○ | 2.498 | ALPHA | 30.003 |
| □ | 3.502 | RUDDER | -20.000 |
| | | ELEVON | 40.000 |
| | | RUFLR | .000 |

REFERENCE INFORMATION

| | |
|-------|---------|
| SREF | 2.4210 |
| LREF | 35.8410 |
| BREF | 39.8410 |
| XREF | 32.3000 |
| YREF | 0.0000 |
| ZREF | 0.0000 |
| SCALE | 1.000 |

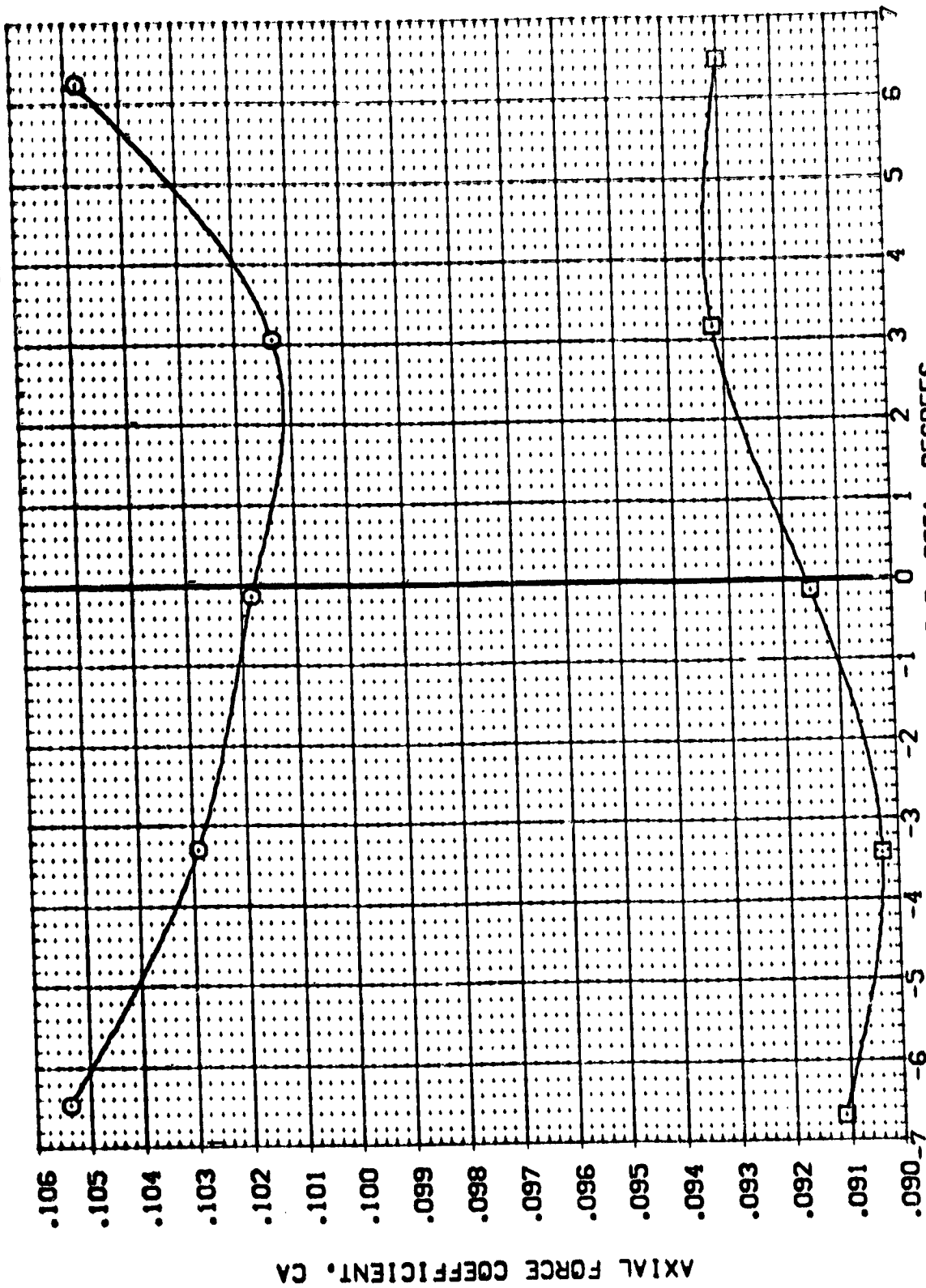


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5,3.5

AVES 87-7C7-CA:2 C2A

| SYMBOL | NAME | PARAMETRIC VALUES |
|-----------------------|-------|-------------------|
| <input type="radio"/> | ALPHA | 30.000 |
| <input type="radio"/> | RODIA | -20.000 |
| <input type="radio"/> | RODIA | 40.000 |

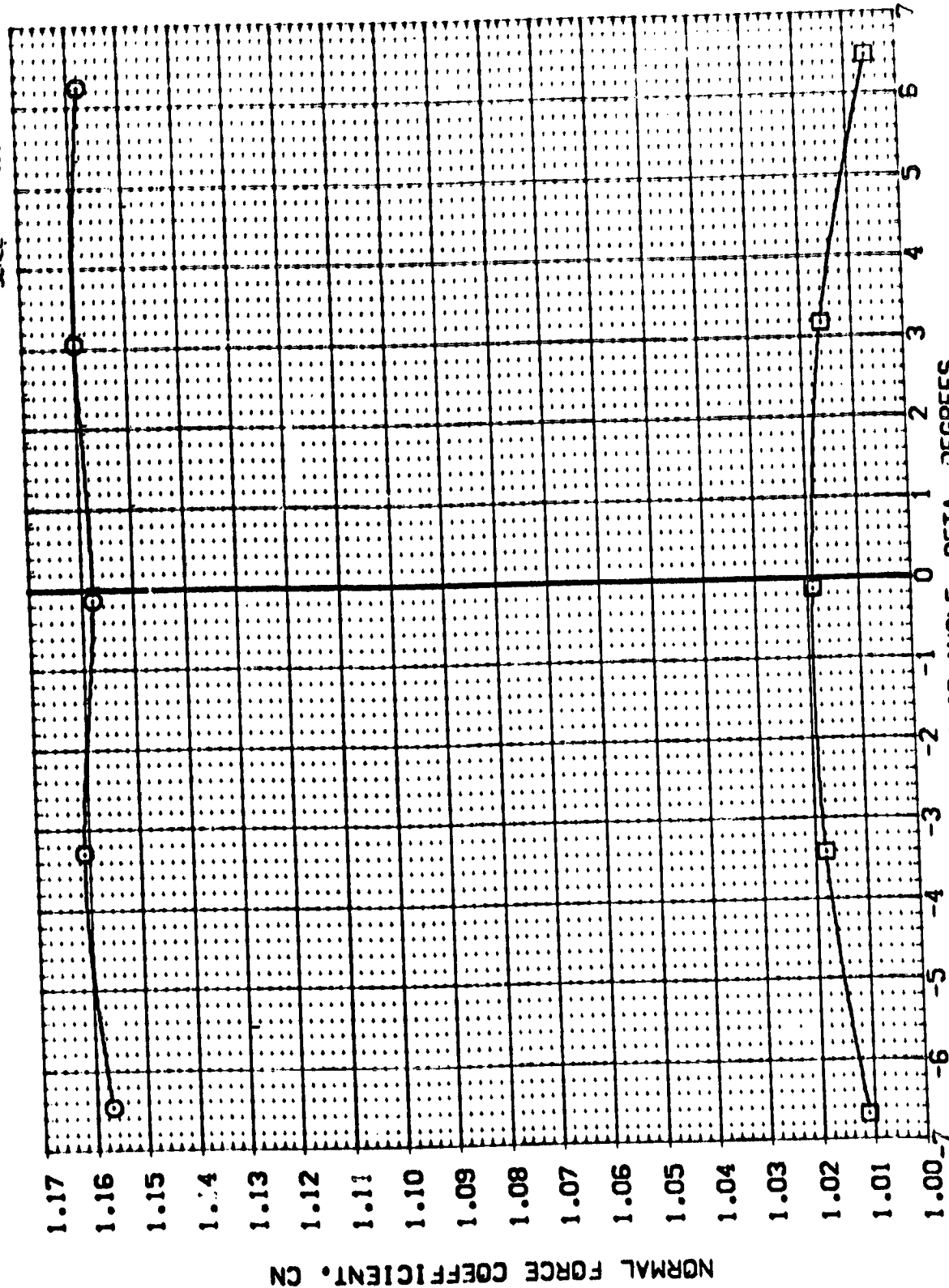
[illegible]

FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5.3.5

AVES 87-707-CA:2

[illegible]

| PARAMETRIC VALUES | WAC | SMBC |
|-------------------|---------|--------|
| ALPHA | 2.498 | () |
| BETA | 0.000 | |
| POWER | -20.000 | |
| ELEVEN | 30.000 | |
| | | 40.000 |
| | | .000 |

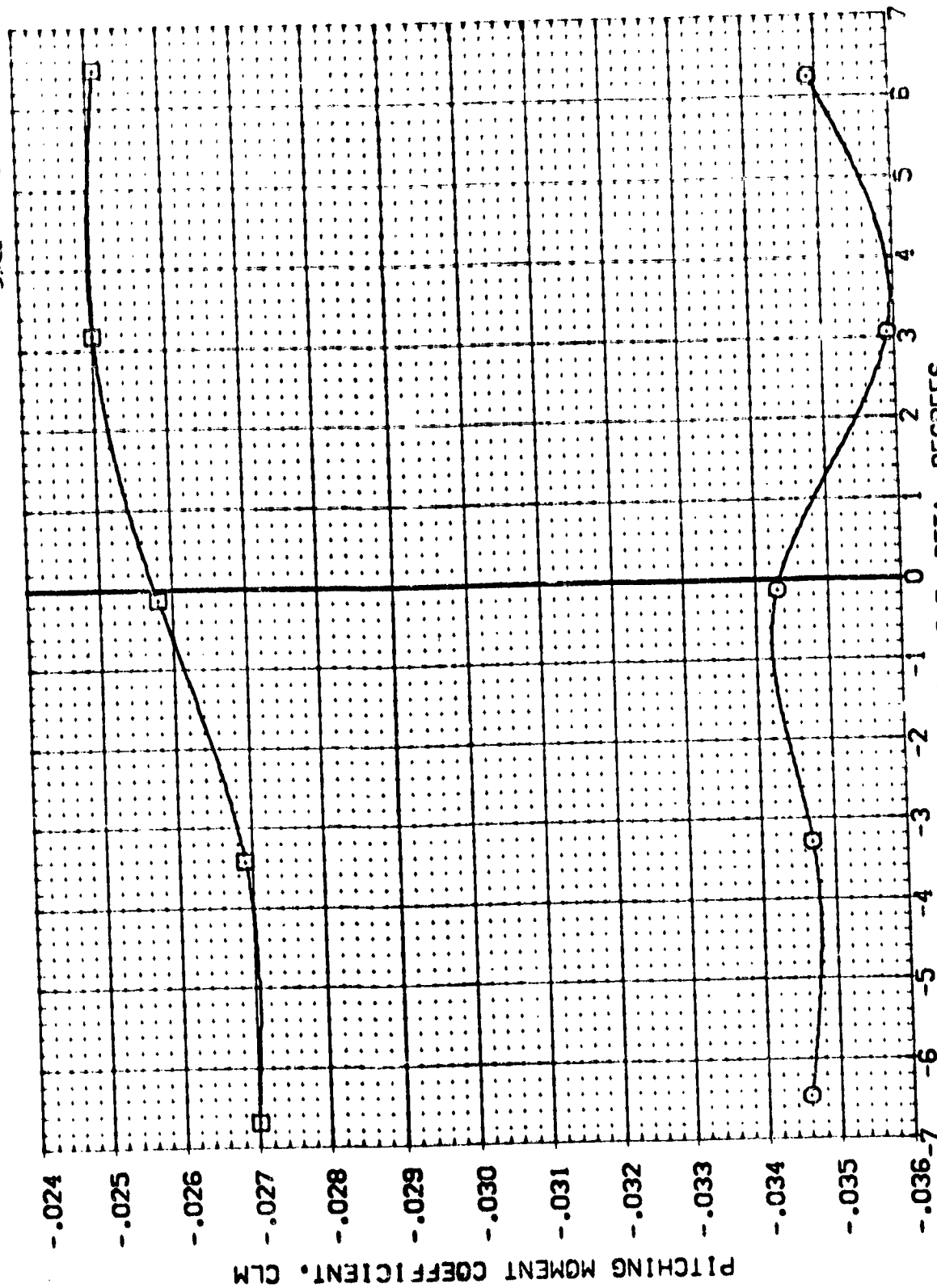


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5, 3.5

(RBG019)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON ROLFELR .000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
VREF 32.3000
WREF 3000
SCALE 1300

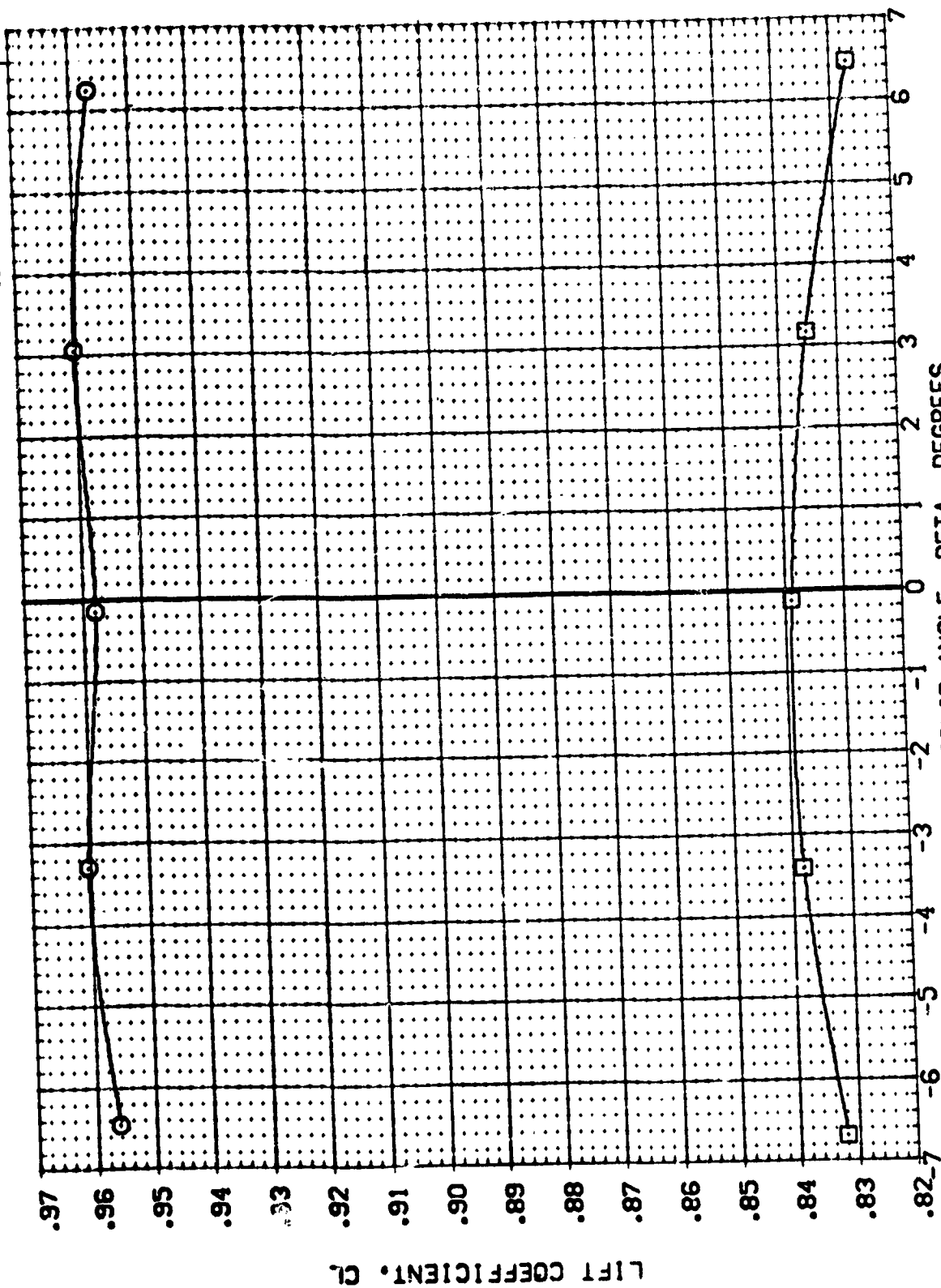


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5, 3.5

AMES 87-707-CA:2

| SYMBOL | MACH | ALPHA | ELEVON | ROOFER | PARAMETRIC VALUES |
|--------|-------|-------|---------|--------|-------------------|
| 0 | 2.498 | | 30.000 | | .000 |
| 1 | 3.502 | | -20.000 | | 49.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SPEE | 2.42:0 |
| REF | 39.84:0 |
| FREQ | 39.84:0 |
| NRPO | 32.50:0 |
| VPRO | .0000 |
| ZPRO | .0000 |
| SCALE | .0300 |

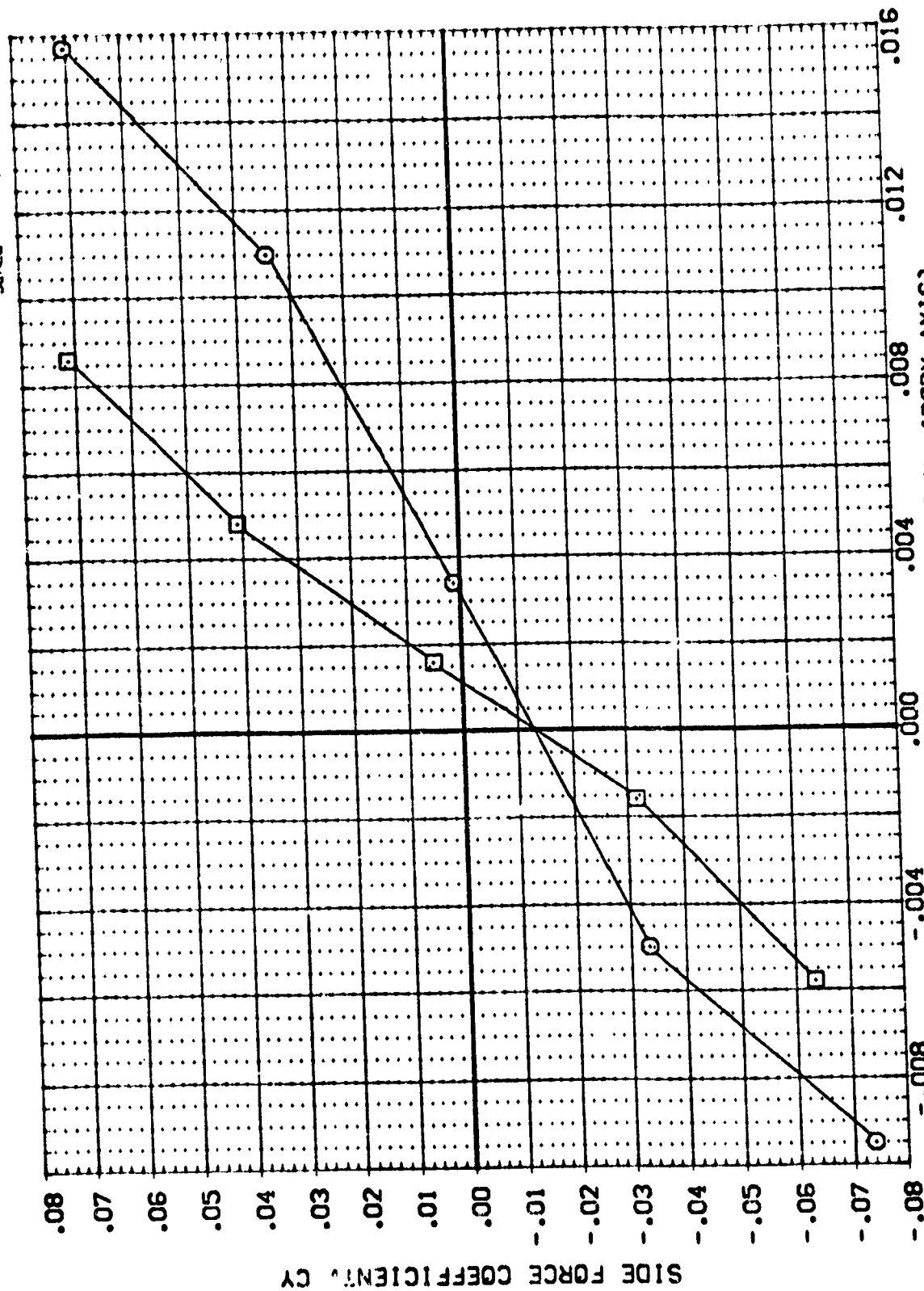


FIG.67 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20 DEGS. MN=2.5,3.5

(RB0020)

AMES 87-707-CA12 C2A

SYMBOL ☐ MACH 2.498 ALPHA 30.000 ELEVON 10.000
☐ 3.501 RUDDER .000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 39.8490
 BREF 39.8490
 XPRP 32.3000
 YPRP .0000
 ZPRP .0000
 SCALE 10.000

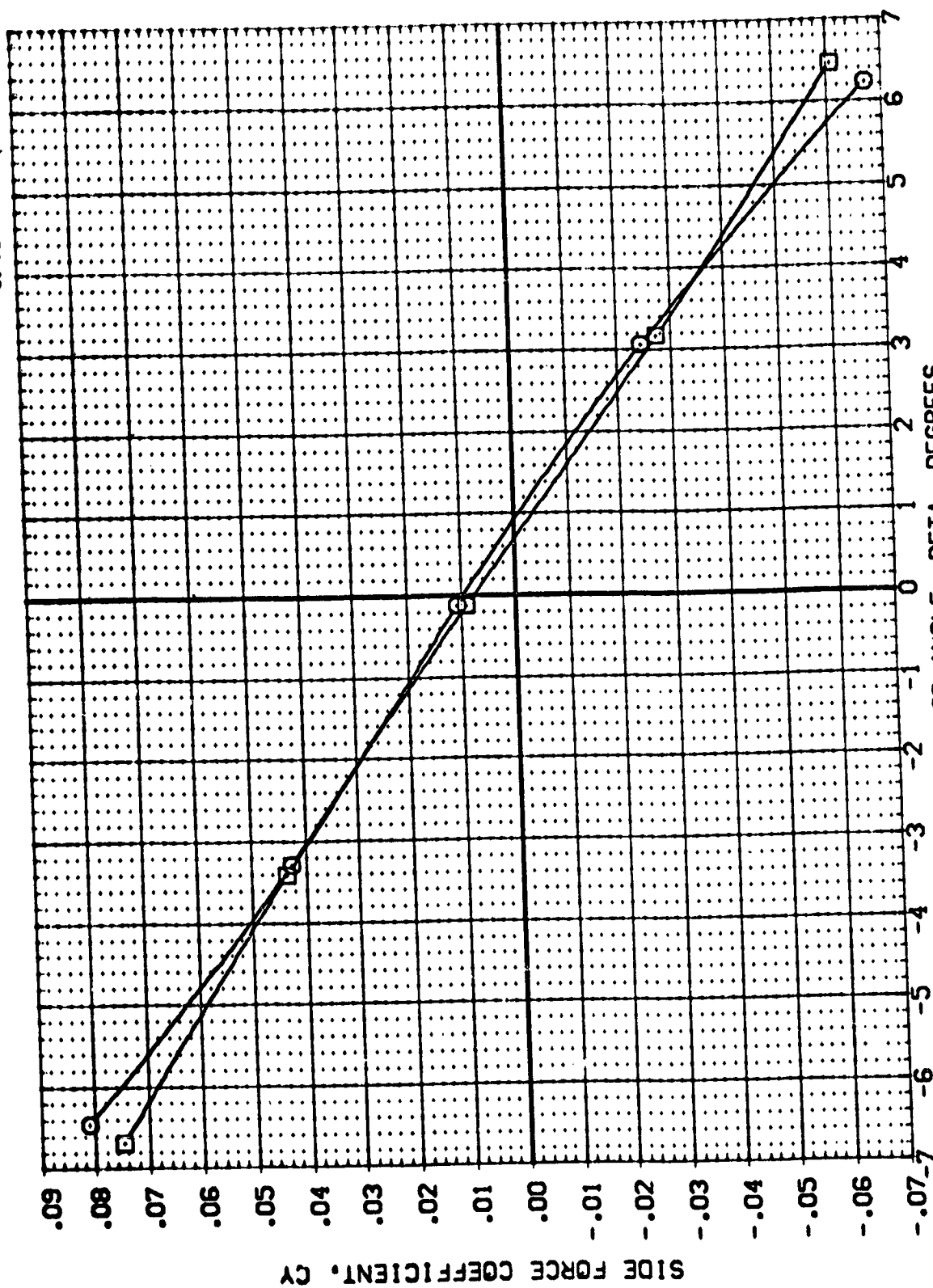


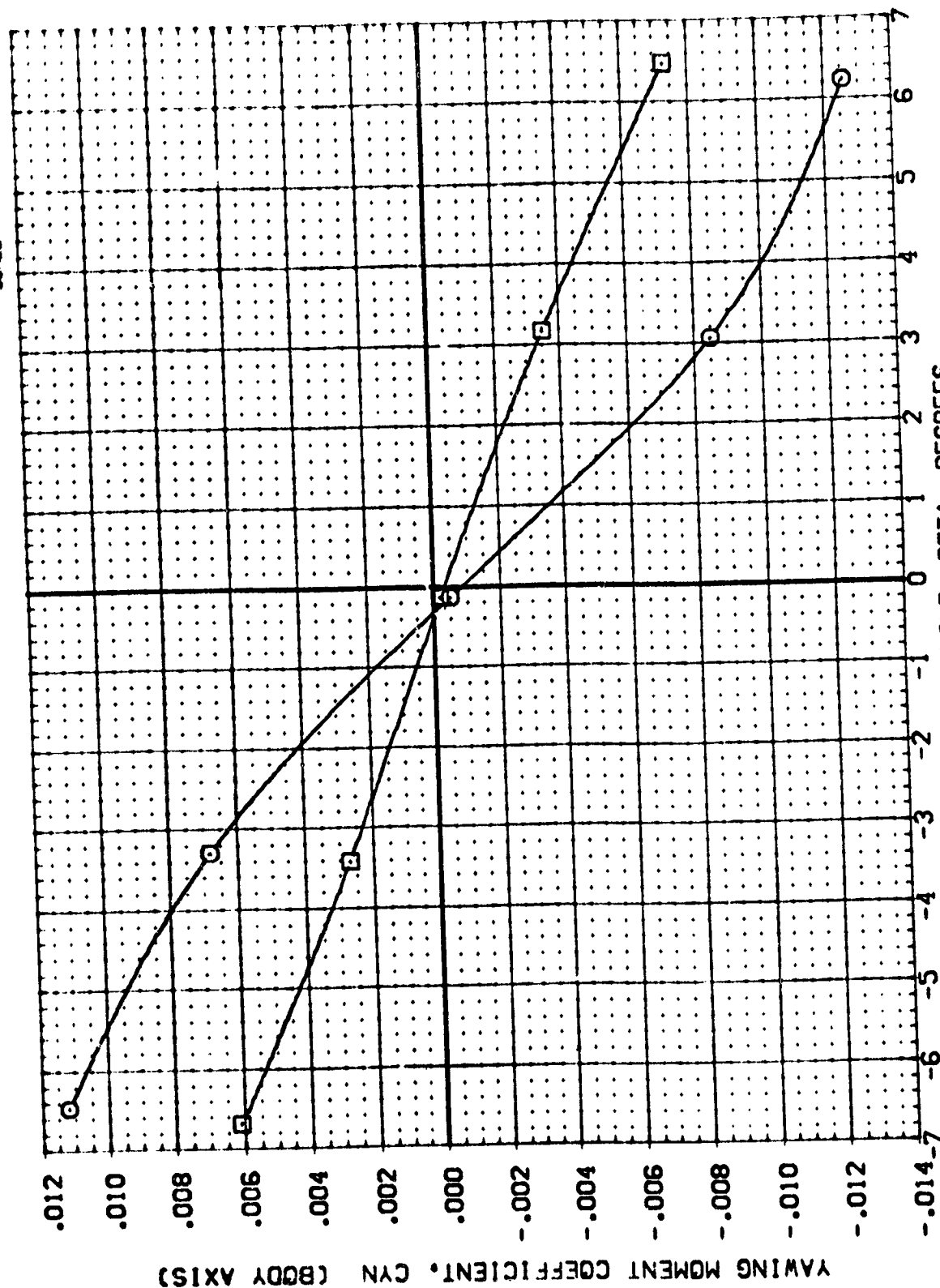
FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
 STOE SLIP ANGLE, BETA, DEGREES

(RBG020)

AVES 87-707-CA12 C2A

| SYMBOL | WACH | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | 10.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|--------|--------|--------|
| ○ | 2.498 | | | 30.000 | | | | |
| □ | 3.501 | | | .000 | | | | |

REFERENCE INFORMATION
SREF 2.4212
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF .0000
ZREF .0000
SCALE .0000



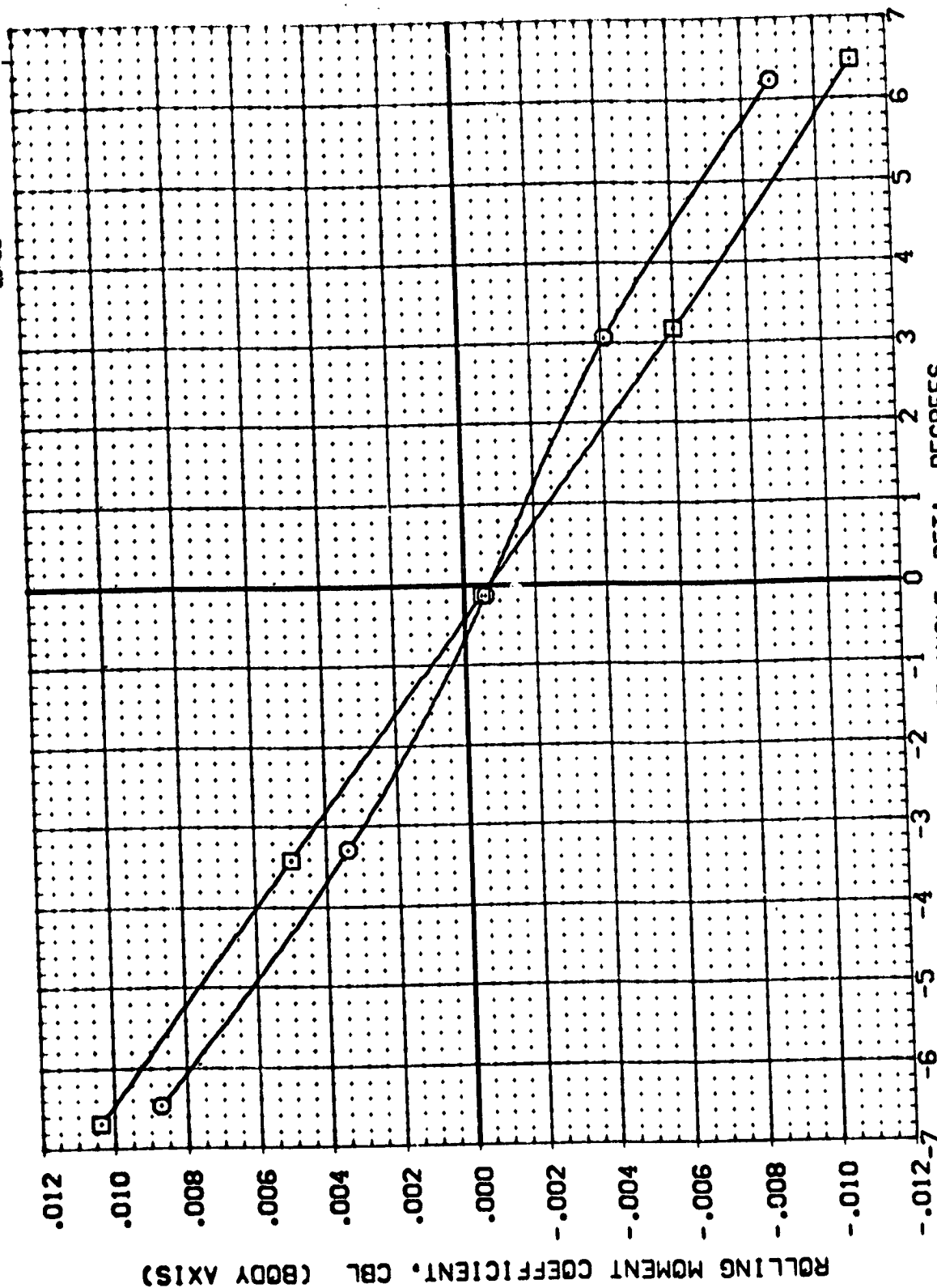
SIDESLIP ANGLE, BETA, DEGREES
FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
PAGE 572

(RB0020)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 ROLLER 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 28.8150
 BREF 39.8150
 XREF 37.3000
 YREF 0.0000
 ZREF 0.0000
 SCALE 0.0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R80020)

AMES 87-707-GA12 C2A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 ROFLR 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XARP 32.3000
YARP .0000
ZARP .0000
SCALE .0000

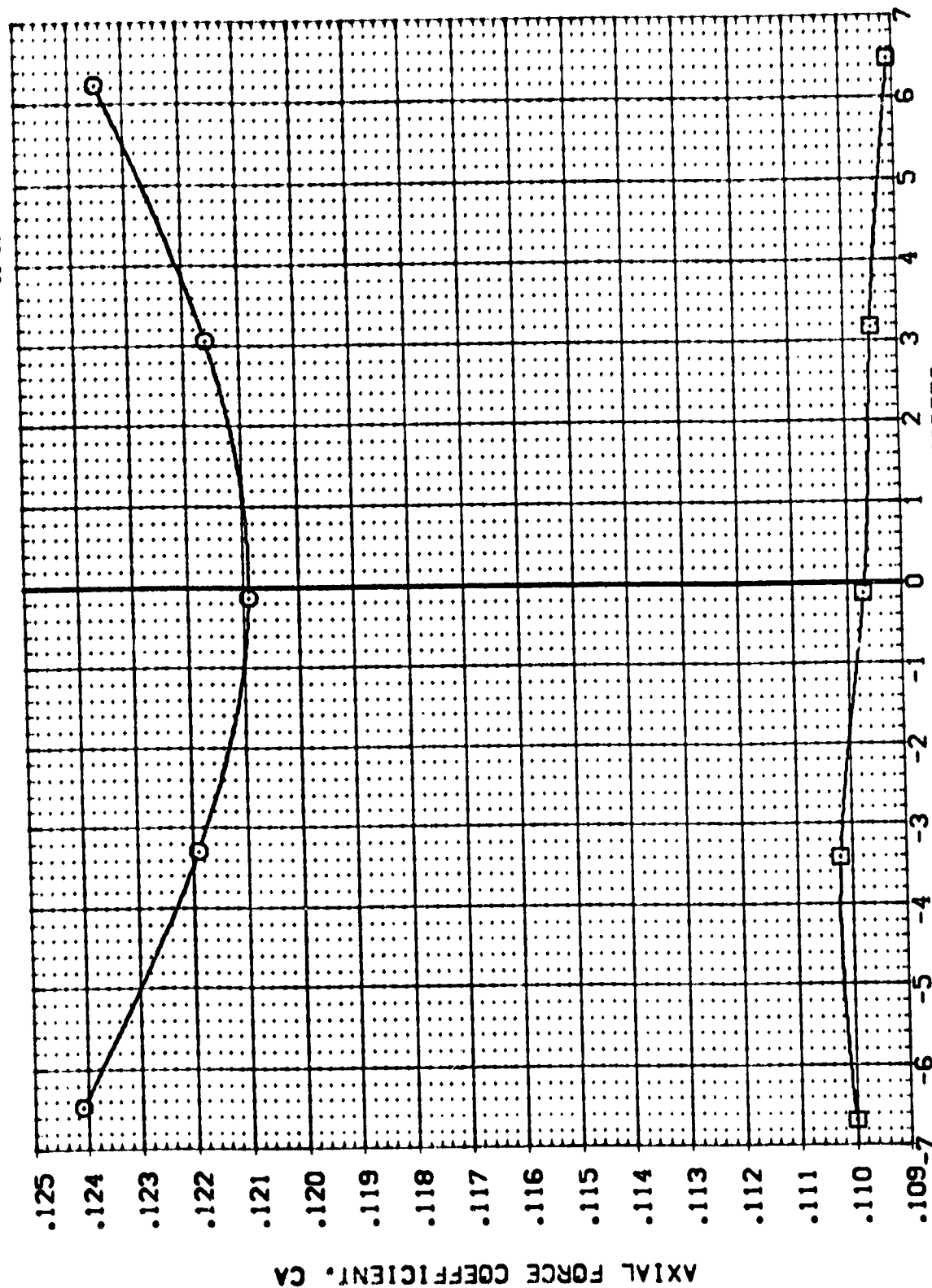


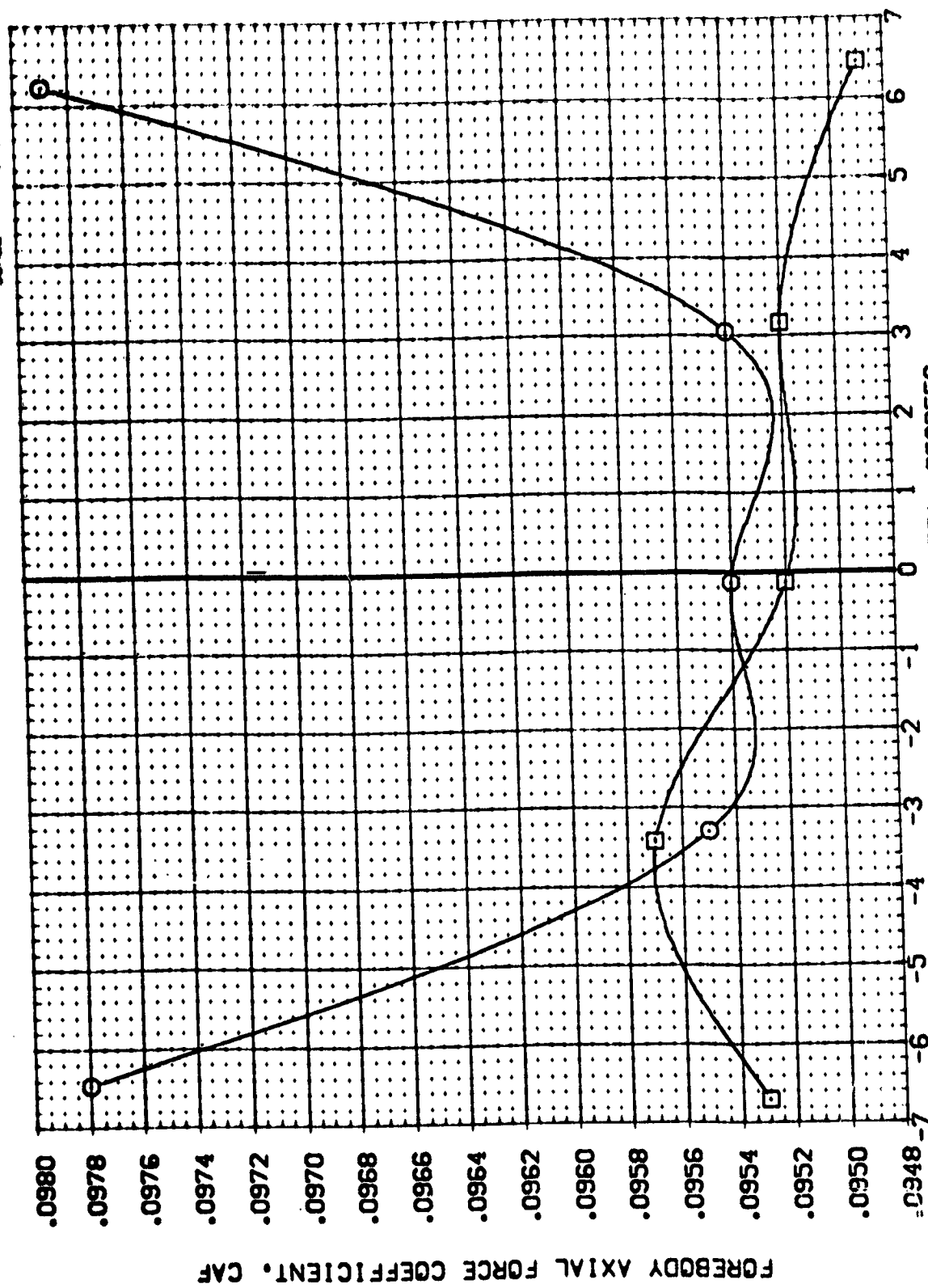
FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RB00020)

AMES 87-707-0A12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON 10.000 ROLLER 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8450
BREF 39.8450
XREF 32.3000
YREF 32.3000
ZREF 32.3000
SCALE



SIDESLIP ANGLE, BETA, DEGREES

FIG. 68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R80020)

AMES 87-707-0A12 C2A

SYMBOL MACH ALPHA RUDDER
2.498 30.000 ELEVON 10.000
3.501 40.000

PARAMETRIC VALUES

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XREF 32.3000
YREF 0.0000
ZREF 0.0000
SCALE 10000

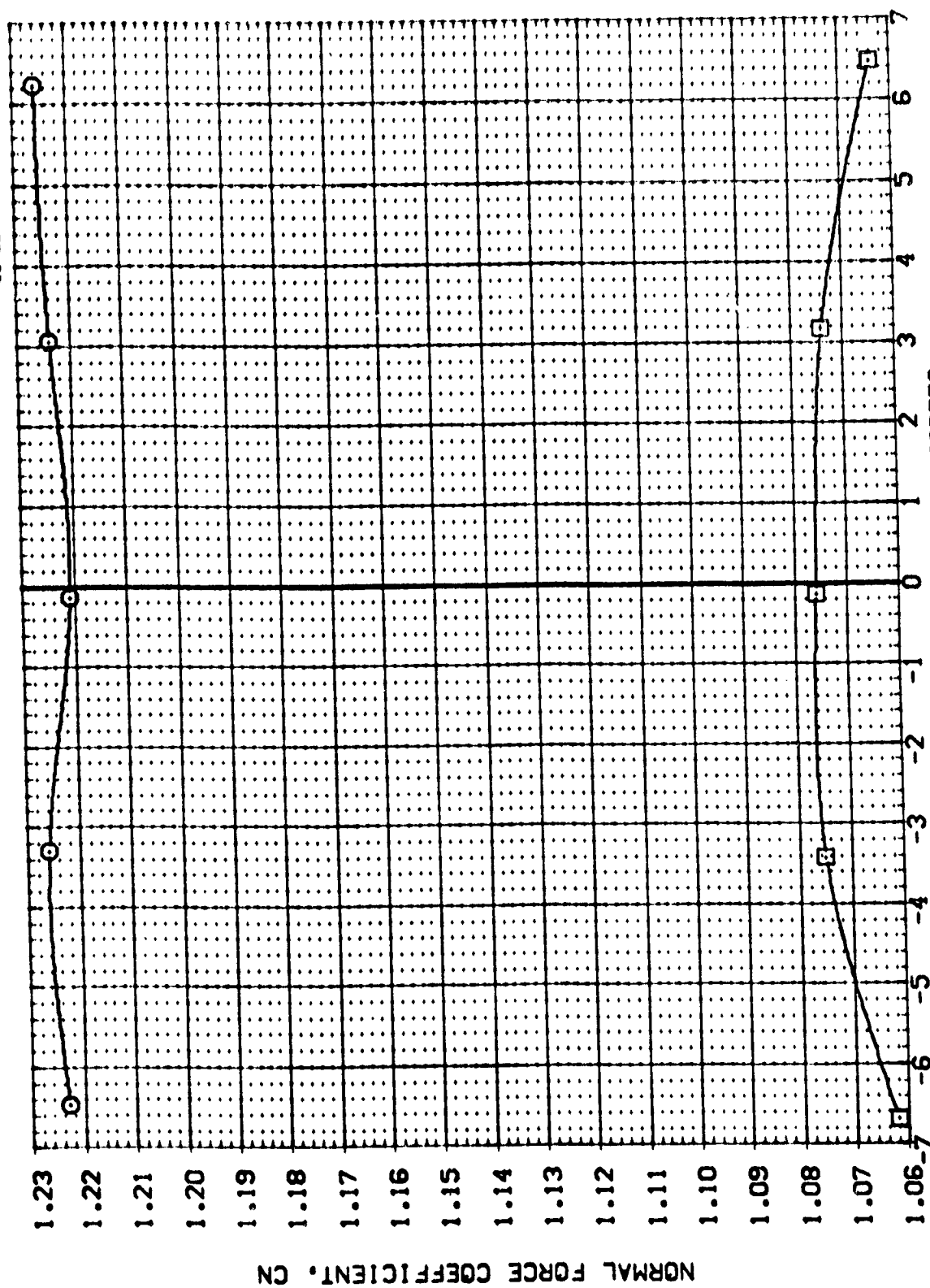


FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(R80020)

AVES 87-707-CA12 02A

SYMBOL MACH 2.498 ALPHA 30.000 ELEVON 10.000
 .501 RUDDER .000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8450
 BREF 39.8450
 YARP 32.3000
 ZARP .0000
 SCALE .0300

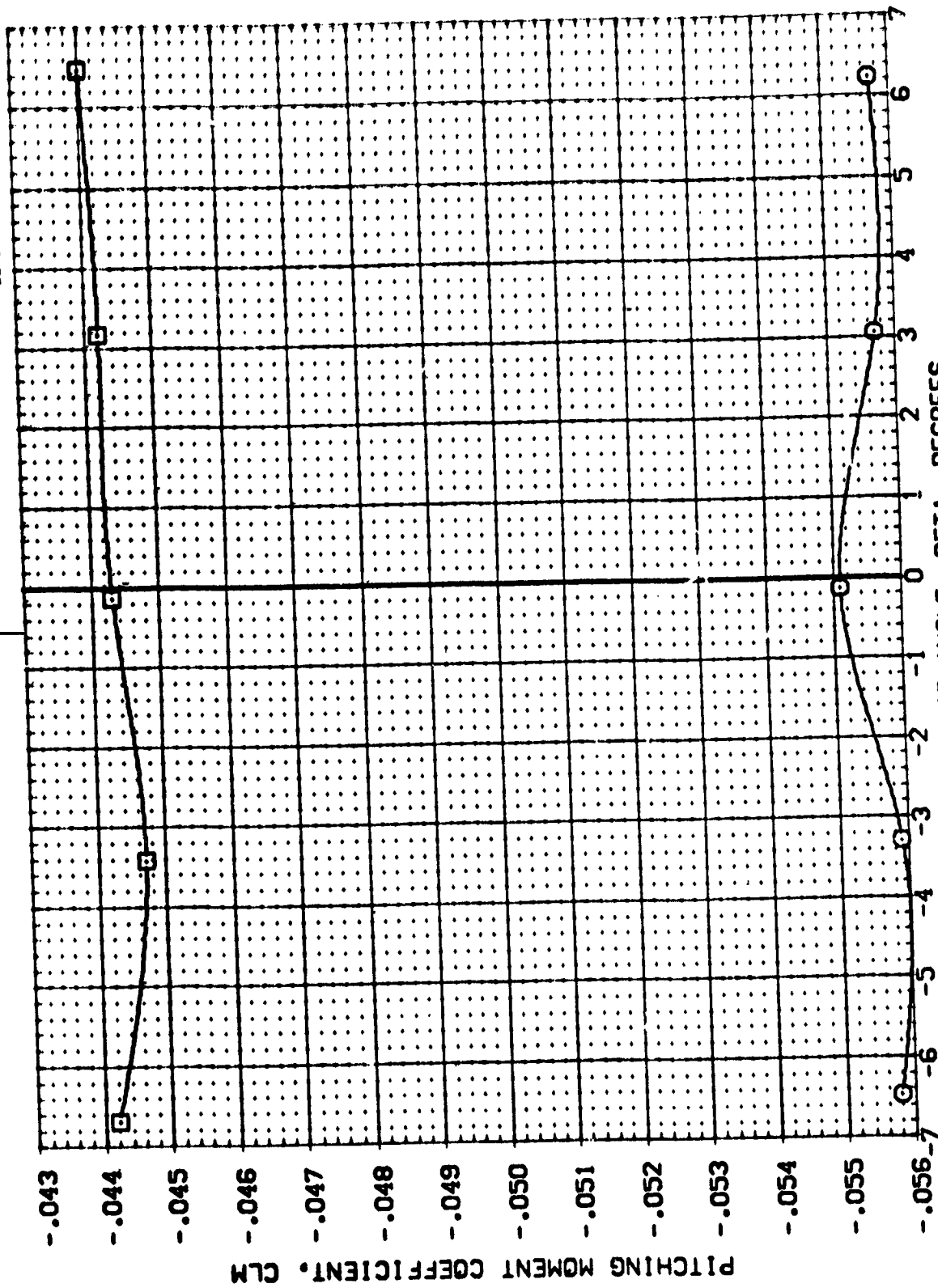


FIG. 68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5

(RB0020)

AMES R7-707-CA12 32A

SYMBOL WACH ALPHA RUDDER
 2.498 3.501
 30.000 40.000
 10.000 40.000

REFERENCE INFORMATION
 SREF 2.4210
 XREF 39.845C
 YREF 39.845C
 XAPP 32.300C
 YAPP 32.300C
 ZAPP 32.300C
 SCALE 1.000

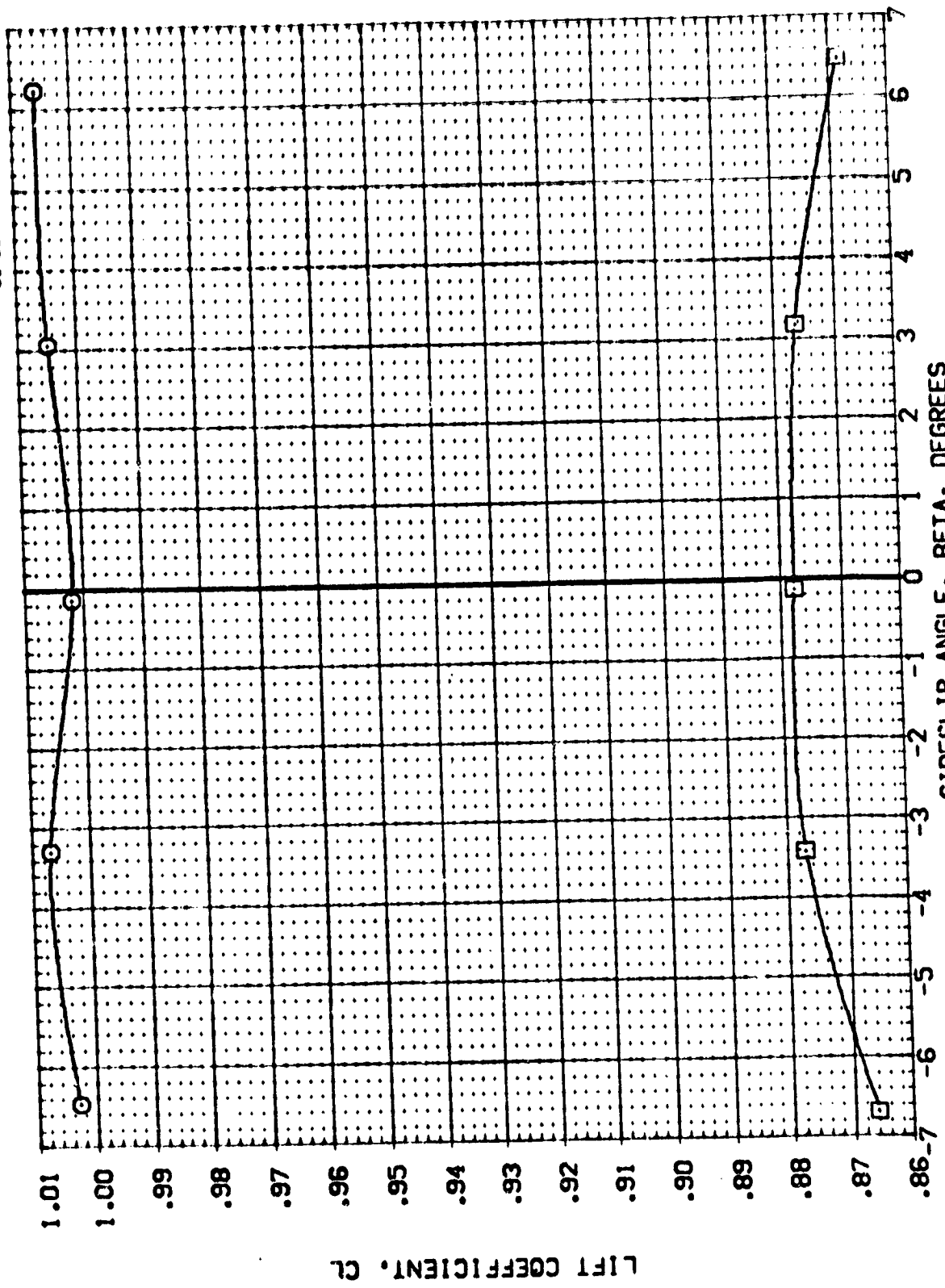


FIG.68 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=10 DEGS, MN=2.5, 3.5
 Sideslip Angle, BETA, DEGREES
 PAGE 578

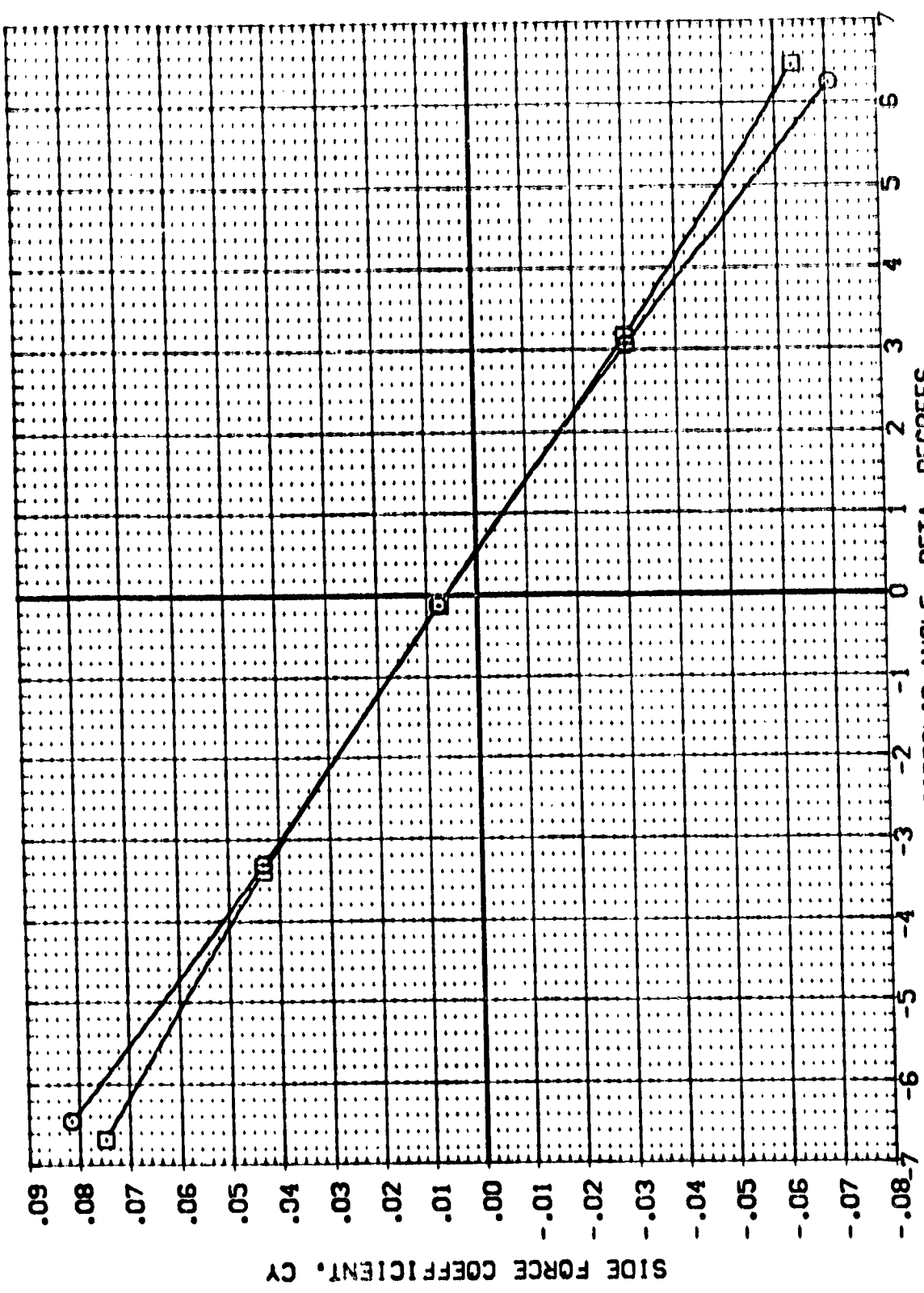
(R83021)

AVES 87-707-CA12 C2A

| SYMBOL | WAC | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | -20.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|--------|---------|--------|
| ○ | 2.498 | | | | | | | |
| □ | 3.503 | | | | | | | |

REFERENCE INFORMATION

| SYMBOL | WAC | ALPHA | RUDDER | PARAMETRIC VALUES | ELEVON | RUDDER | -20.000 | 40.000 |
|--------|-------|-------|--------|-------------------|--------|--------|---------|--------|
| ○ | 2.498 | | | | | | | |
| □ | 3.503 | | | | | | | |



SIDESLIP ANGLE, BETA, DEGREES

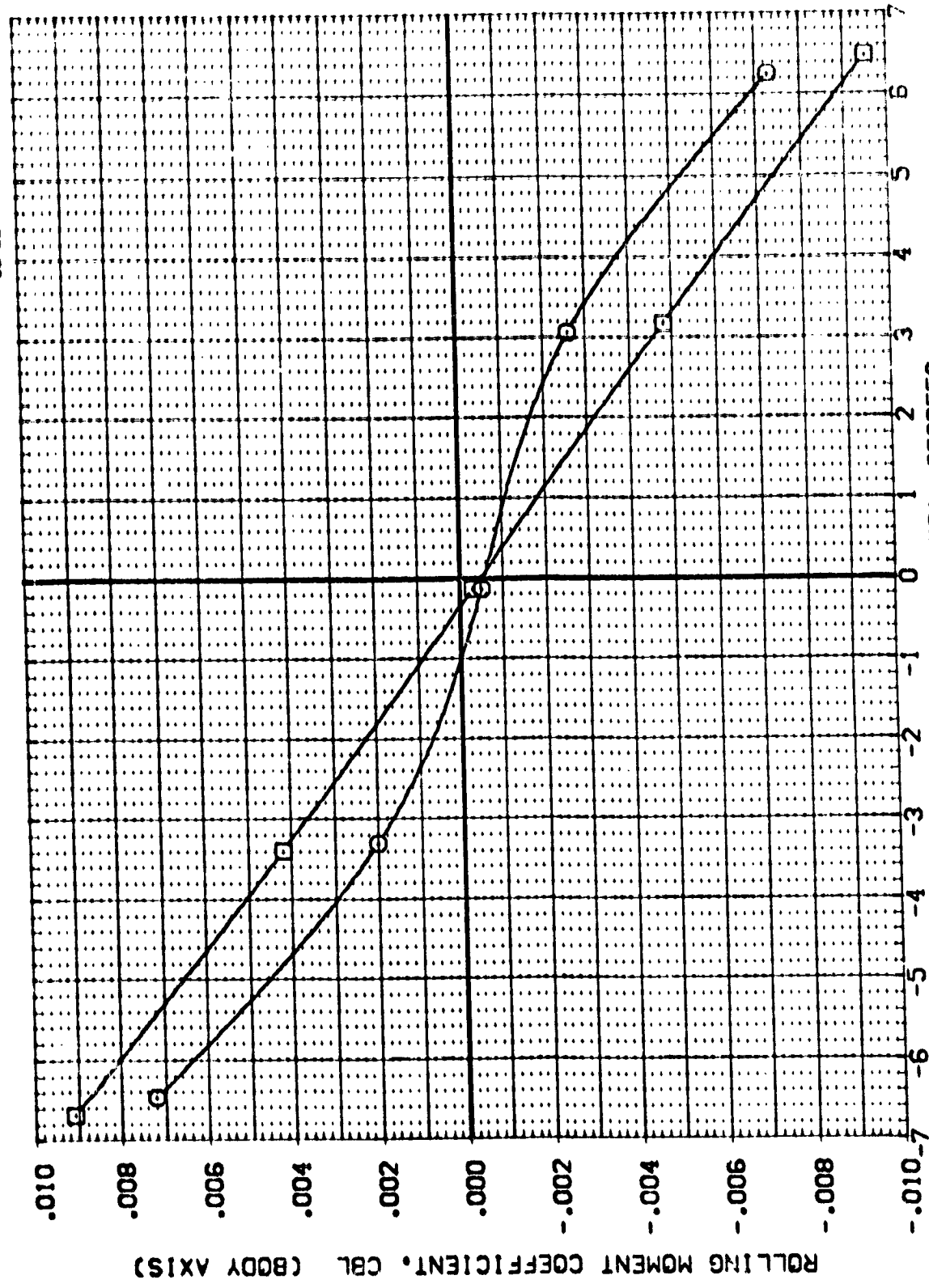
FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20, DEGS, WAC=2.5, 3.5

(R35021)

AVES 87-707-CA12 C2A

SYMBOL: 2.498 3.503 30.000 40.000 30.000 40.000
 WACH: 2.498 3.503 30.000 40.000 30.000 40.000
 PARAMETRIC VALUES: 30.000 40.000 30.000 40.000 30.000 40.000
 ALPHA: 30.000 40.000 30.000 40.000 30.000 40.000
 RUDDER: 30.000 40.000 30.000 40.000 30.000 40.000

REFERENCE INFORMATION:
 1. 42.00
 2. 84.00
 3. 84.00
 4. 84.00
 5. 84.00
 6. 84.00
 7. 84.00
 8. 84.00
 9. 84.00
 10. 84.00
 11. 84.00
 12. 84.00
 13. 84.00
 14. 84.00
 15. 84.00
 16. 84.00
 17. 84.00
 18. 84.00
 19. 84.00
 20. 84.00
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 22. 84.00
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 26. 84.00
 27. 84.00
 28. 84.00
 29. 84.00
 30. 84.00
 31. 84.00
 32. 84.00
 33. 84.00
 34. 84.00
 35. 84.00
 36. 84.00
 37. 84.00
 38. 84.00
 39. 84.00
 40. 84.00
 41. 84.00
 42. 84.00
 43. 84.00
 44. 84.00
 45. 84.00
 46. 84.00
 47. 84.00
 48. 84.00
 49. 84.00
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 53. 84.00
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 61. 84.00
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 90. 84.00
 91. 84.00
 92. 84.00
 93. 84.00
 94. 84.00
 95. 84.00
 96. 84.00
 97. 84.00
 98. 84.00
 99. 84.00
 100. 84.00



SIDESLIP ANGLE, BETA DEGREES

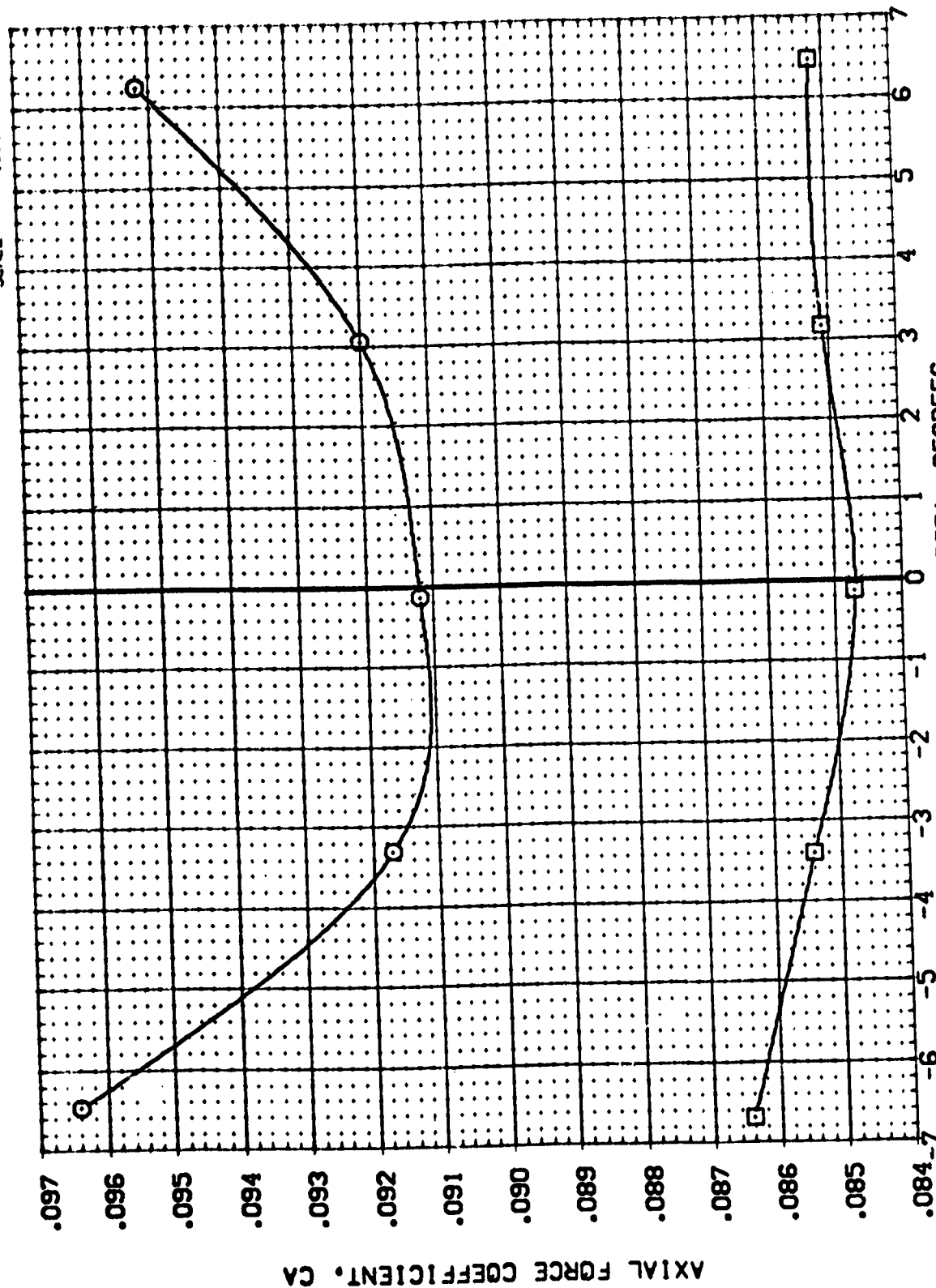
FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20, ELEVON=20, ELEVON=30, ELEVON=40, ELEVON=50, ELEVON=60, ELEVON=70, ELEVON=80, ELEVON=90, ELEVON=100, ELEVON=110, ELEVON=120, ELEVON=130, ELEVON=140, ELEVON=150, ELEVON=160, ELEVON=170, ELEVON=180, ELEVON=190, ELEVON=200, ELEVON=210, ELEVON=220, ELEVON=230, ELEVON=240, ELEVON=250, ELEVON=260, ELEVON=270, ELEVON=280, ELEVON=290, ELEVON=300, ELEVON=310, ELEVON=320, ELEVON=330, ELEVON=340, ELEVON=350, ELEVON=360, ELEVON=370, ELEVON=380, ELEVON=390, ELEVON=400, ELEVON=410, ELEVON=420, ELEVON=430, ELEVON=440, ELEVON=450, ELEVON=460, ELEVON=470, ELEVON=480, ELEVON=490, ELEVON=500, ELEVON=510, ELEVON=520, ELEVON=530, ELEVON=540, ELEVON=550, ELEVON=560, ELEVON=570, ELEVON=580, ELEVON=590, ELEVON=600, ELEVON=610, ELEVON=620, ELEVON=630, ELEVON=640, ELEVON=650, ELEVON=660, ELEVON=670, ELEVON=680, ELEVON=690, ELEVON=700, ELEVON=710, ELEVON=720, ELEVON=730, ELEVON=740, ELEVON=750, ELEVON=760, ELEVON=770, ELEVON=780, ELEVON=790, ELEVON=800, ELEVON=810, ELEVON=820, ELEVON=830, ELEVON=840, ELEVON=850, ELEVON=860, ELEVON=870, ELEVON=880, ELEVON=890, ELEVON=900, ELEVON=910, ELEVON=920, ELEVON=930, ELEVON=940, ELEVON=950, ELEVON=960, ELEVON=970, ELEVON=980, ELEVON=990, ELEVON=1000

(RB0021)

AMES 87-707-CA12 C2A

SYMBOL MACH ALPHA RUDDER
 2.498 30.000 ELEVON -20.000
 3.503 .000 RUDFLR 40.000

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.8490 IN.
 BREF 39.8490 IN.
 XMRD 37.3000 IN.
 YMRD .0000 IN.
 ZMRD .0000 IN.
 SCALE .0000



SIDESLIP ANGLE, BETA, DEGREES

FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(R80021)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER ELEVON RUDFLR
2.498 30.000 .000 -20.000
3.503 30.000 .000 40.000

REFERENCE INFORMATION
SREF 2.4210
LREF 39.8490
BREF 39.8490
XPRD 32.3000
YPRD .0000
ZPRD .0000
SCALE .0000

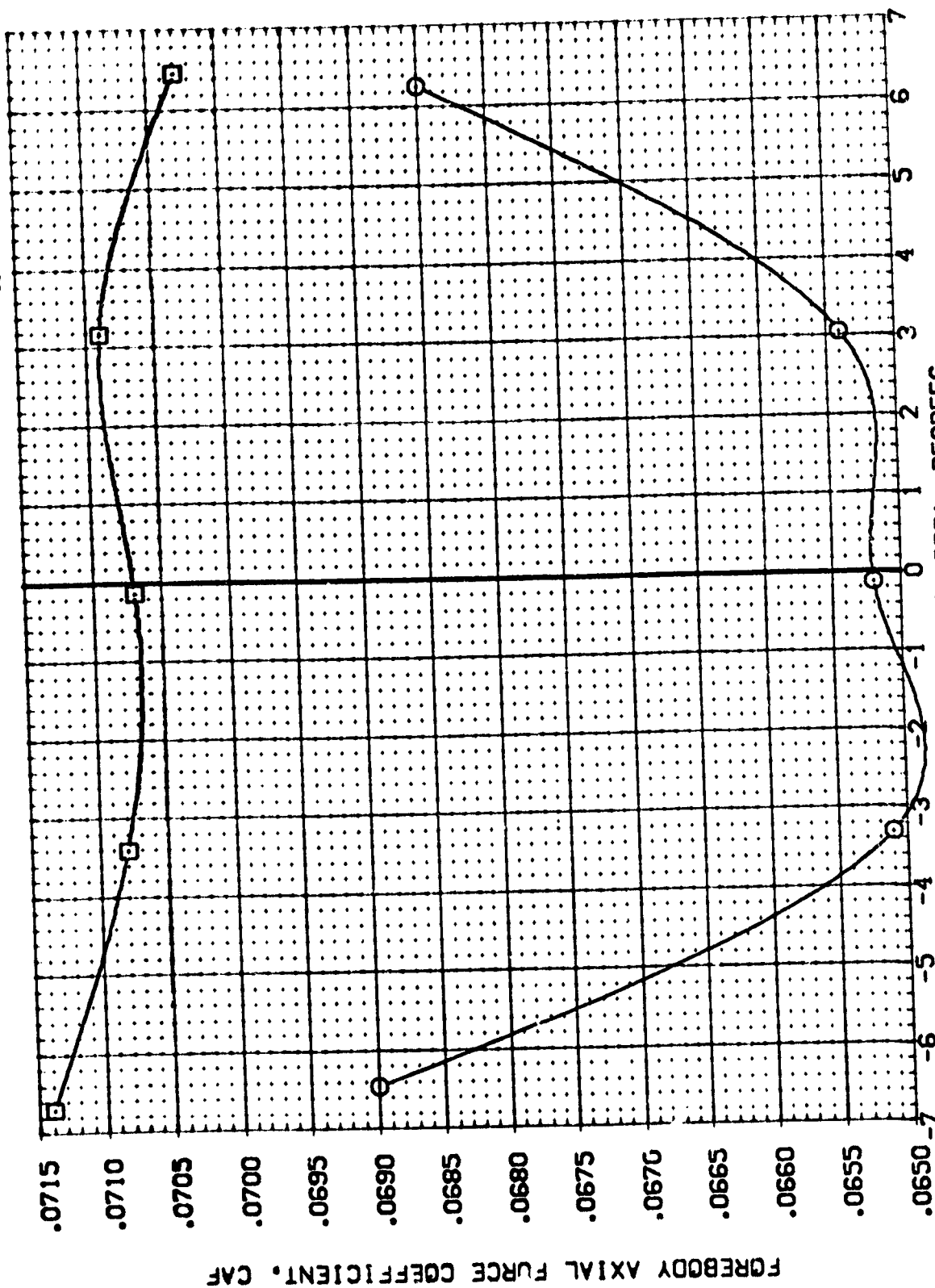
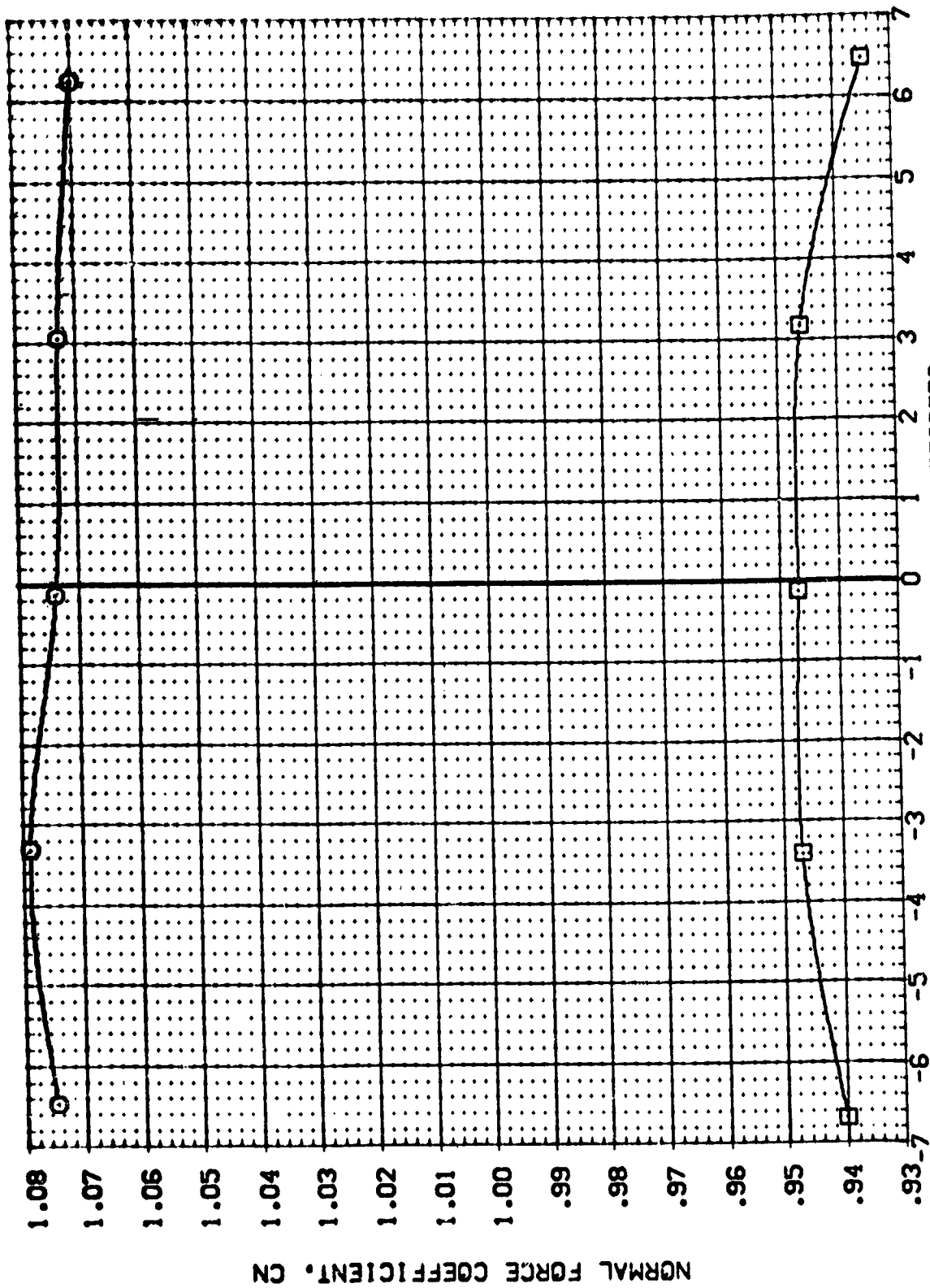


FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(R80021)

AMES 87-707-0A12 02A

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|-----------------|-------------------|------|-----------------|-------------------|------|--------|---------|------|---------|--|------|---------|--|------|---------|--|------|-------|--|------|-------|--|-------|-------|--|
| SYMBOL | MACH | ALPHA
RUDDER | PARAMETRIC VALUES | | ELEVON
RUFLR | -20.000
40.000 | | | | | | | | | | | | | | | | | | | | | |
| | | | 30.000 | .000 | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td>SREF</td> <td>2.4210</td> <td>SO. FT.</td> </tr> <tr> <td>LREF</td> <td>39.8490</td> <td></td> </tr> <tr> <td>BREF</td> <td>29.8490</td> <td></td> </tr> <tr> <td>XPRP</td> <td>30.3000</td> <td></td> </tr> <tr> <td>YPRP</td> <td>.0000</td> <td></td> </tr> <tr> <td>ZPRP</td> <td>.0000</td> <td></td> </tr> <tr> <td>SCALE</td> <td>.0300</td> <td></td> </tr> </table> | | | | | | | SREF | 2.4210 | SO. FT. | LREF | 39.8490 | | BREF | 29.8490 | | XPRP | 30.3000 | | YPRP | .0000 | | ZPRP | .0000 | | SCALE | .0300 | |
| SREF | 2.4210 | SO. FT. | | | | | | | | | | | | | | | | | | | | | | | | | |
| LREF | 39.8490 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BREF | 29.8490 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| XPRP | 30.3000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YPRP | .0000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZPRP | .0000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCALE | .0300 | | | | | | | | | | | | | | | | | | | | | | | | | | |



SIDESLIP ANGLE, BETA, DEGREES

FIG. 69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RB0021)

AMES 87-707-0A12 02A

SYMBOL MACH PARAMETRIC VALUES
2.498 ALPHA 30.000 ELEVON -20.000
3.503 RUDDER .000 RUDER 40.000

REFERENCE INFORMATION
SPREF 2.4210 SCALE
LREF 39.8450
BREF 39.8450
XPRD 32.3000
YPRD .0000
ZPRD .0000
SCALE .0300

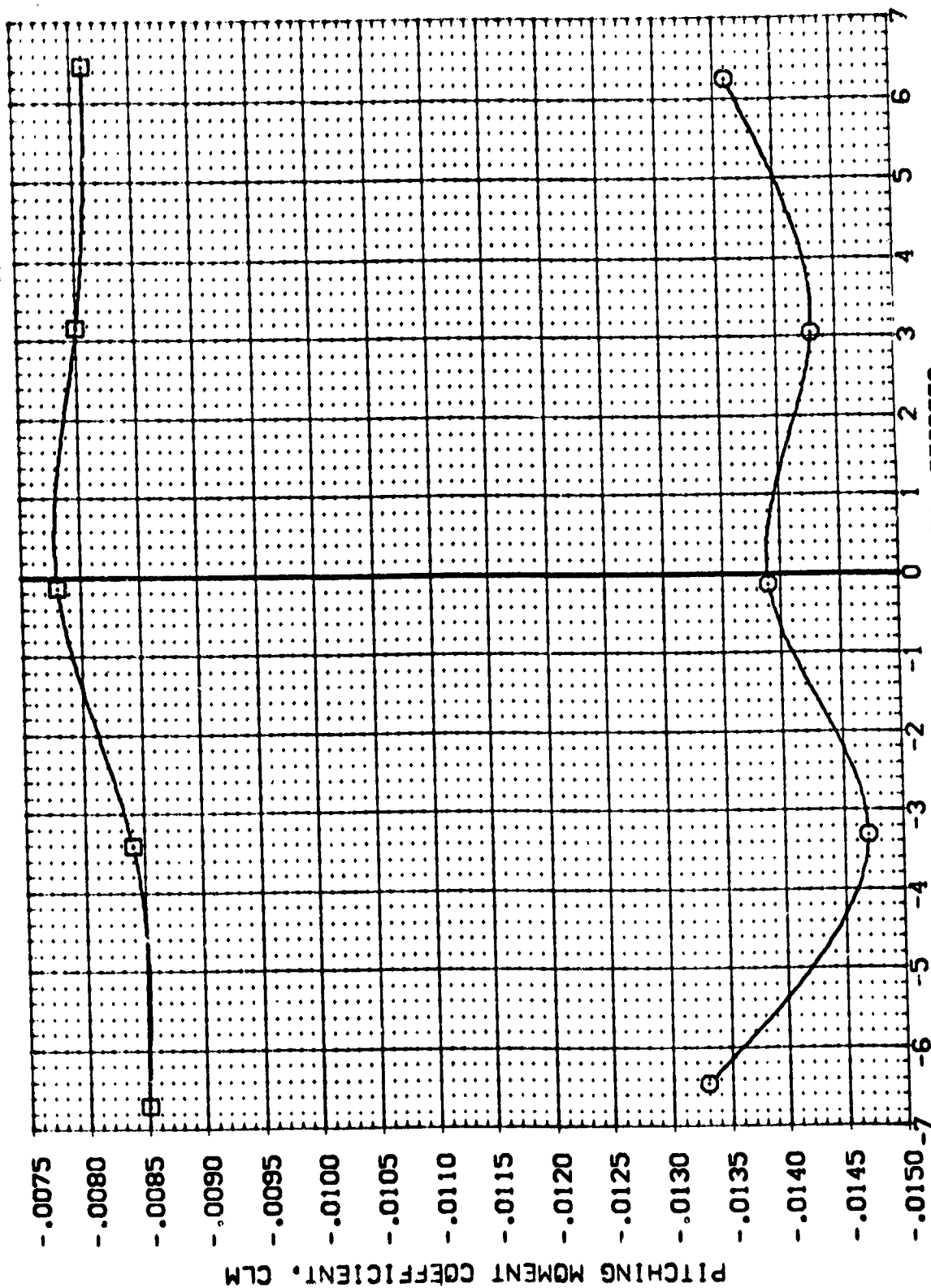


FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5
SIDESLIP ANGLE, BETA, DEGREES
PAGE 586

AMES 87-707-0A12 02A

OL
SYMBOL

MACM
2.49
3.50

ALPHA
RUBBER

PARAMETER
30.000
.000

| PARAMETRIC VALUES | ELEVON | RJOF LR |
|-------------------|--------|---------|
| 30.000 | | |
| .000 | | |

40.000
-20.000

| | | |
|-------|---------|--------|
| SREF | 2.4210 | SC.FT. |
| LREF | 79.8490 | 1.00 |
| BREF | 79.8490 | 1.00 |
| XREF | 30.3000 | 1.00 |
| YREF | 1.0000 | 1.00 |
| ZREF | 1.0000 | 1.00 |
| SCALE | 1.300 | SCALE |

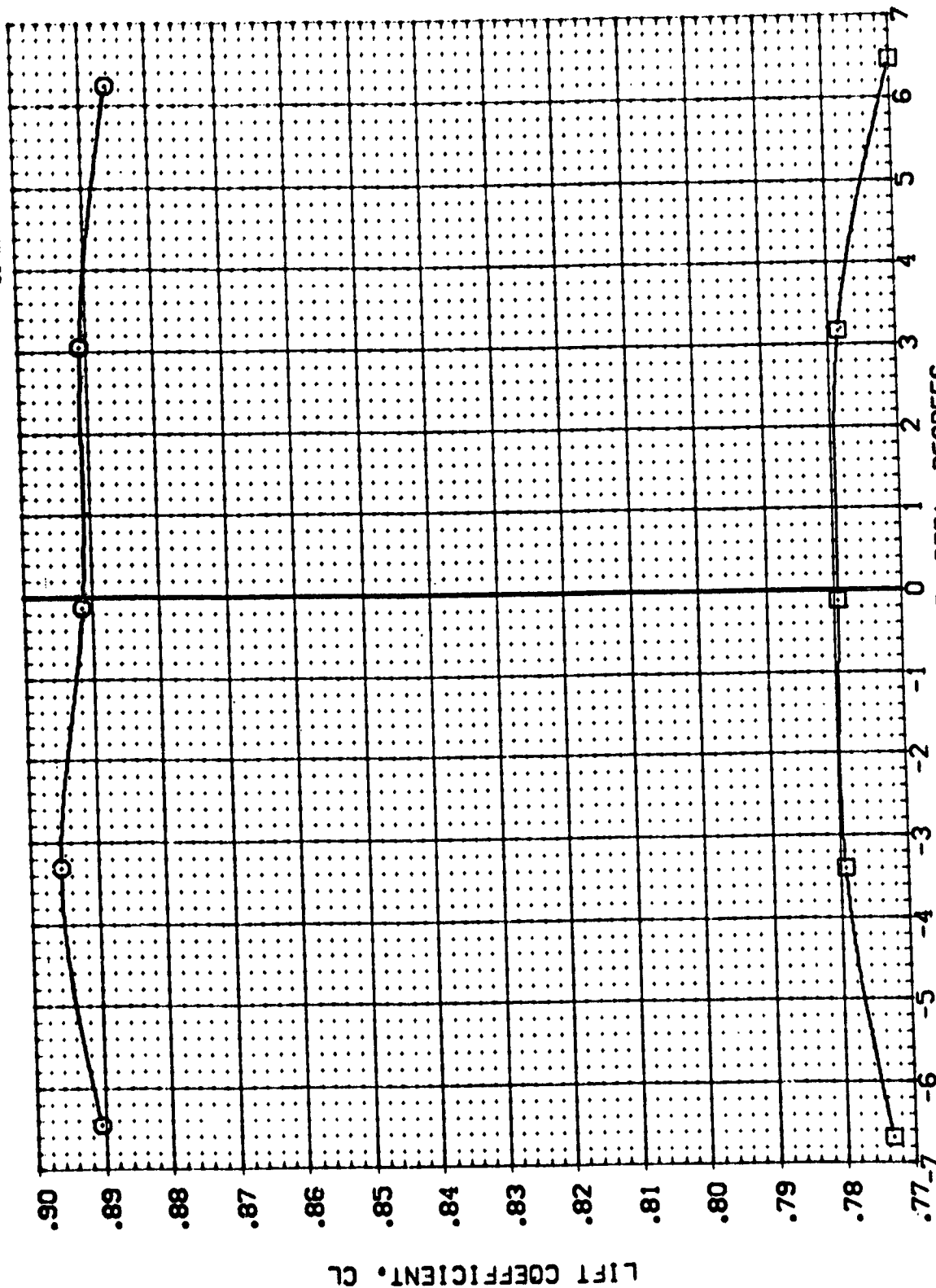


FIG. 69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(RBQ021)

AVES 87-707-0A12 C2A

| SYMBOL | VACH | PARAMETRIC VALUES | | |
|--------|-------|-------------------|--------|--------|
| | | ALPHA | 30.000 | ELEVON |
| □ | 2.498 | RUDDER | .000 | RUOFLR |
| ○ | 3.503 | | | |

REFERENCE INFORMATION

| SRF | 2.4210 | SC.F.T. |
|-------|---------|---------|
| LRF | 39.849C | |
| BRF | 39.849C | |
| XRP | 32.3000 | |
| YRP | .0000 | |
| ZRP | .0000 | |
| SCALE | .0300 | |

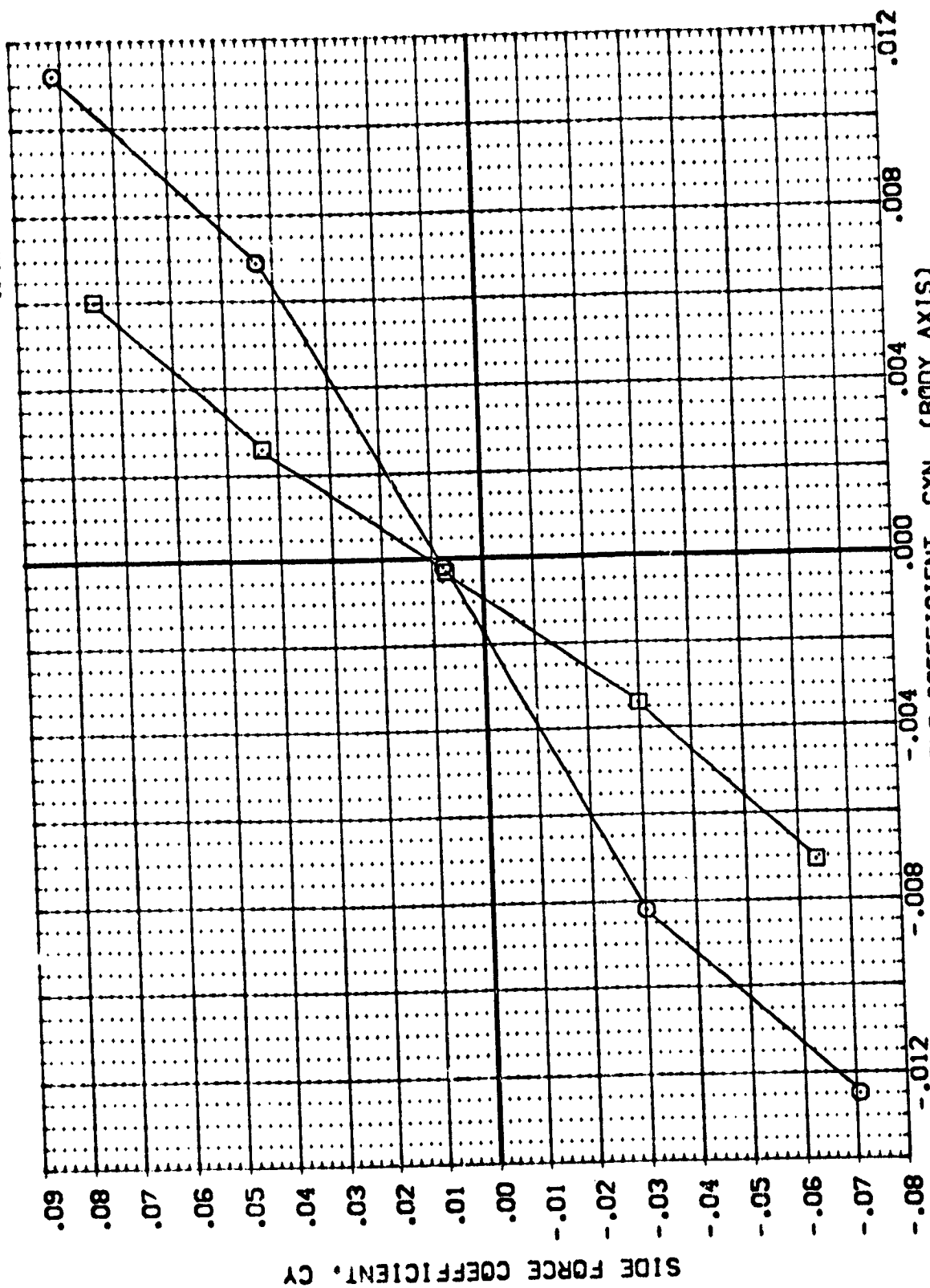


FIG.69 ORBITER LAT-DIR. AERO DATA, ALPHA=30, RUDDER=-20, ELEVON=-20 DEGS, MN=2.5, 3.5

(R8Q022)

AMES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER PARAMETRIC VALUES ELEVON .000 40.000
 2.498 3.502 20.000 .000 ROLF.R

REFERENCE INFORMATION
SREF 2.421G
LREF 39.845C
BREF 39.845C
MREF 32.300C
WREF .000C
ZREF .000C
SCALE .000C

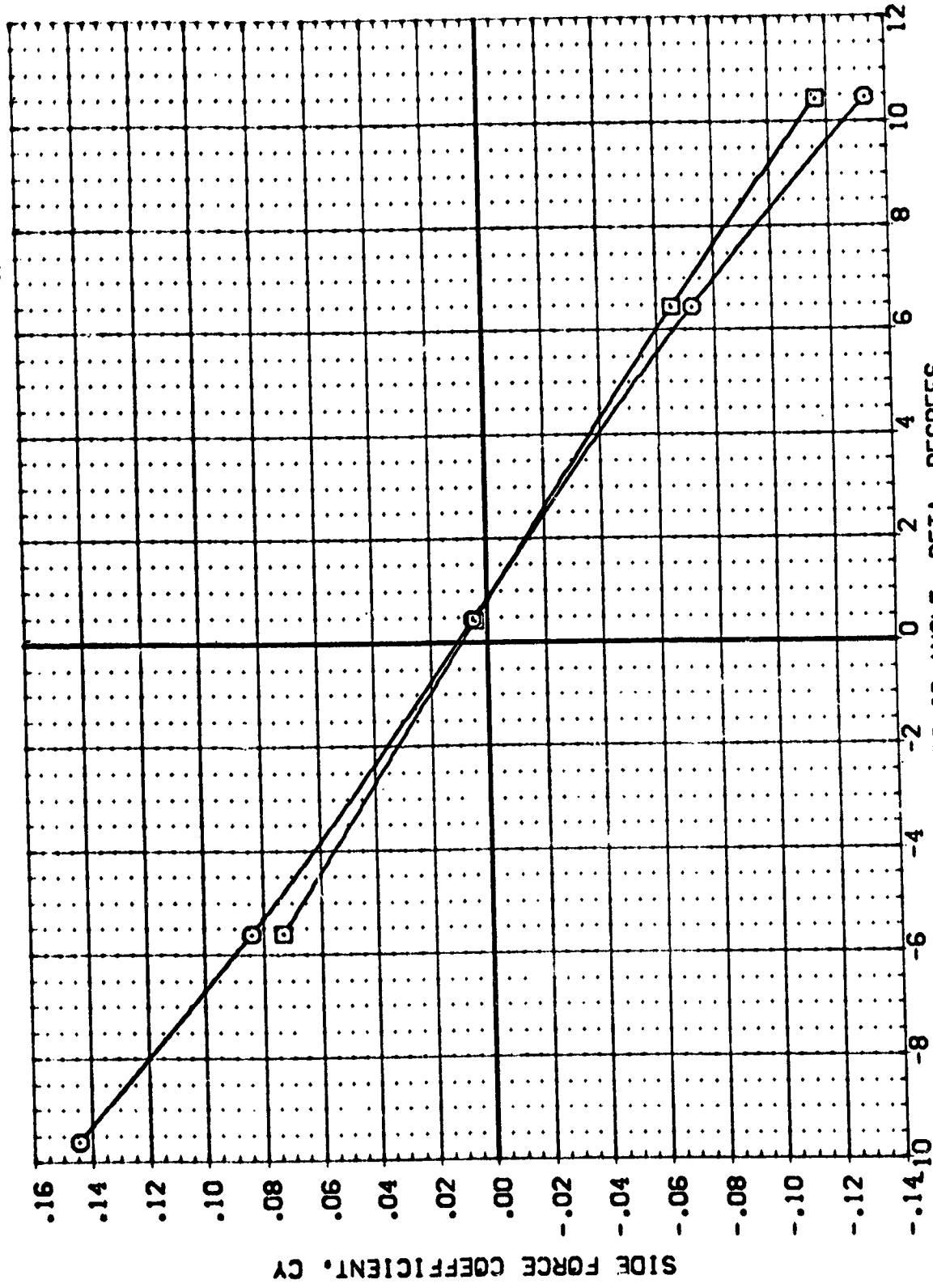


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(RBQ022)

AVES 87-707-CA:2 C2A

| SYMBOL | W/CH | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| | | ALPHA | ELEVON |
| □ | 2.498 | 20.000 | .000 |
| ○ | 3.502 | .000 | 40.000 |

REFERENCE INFORMATION

| SREF | 2.4212 |
|-------|---------|
| LREF | 39.8490 |
| BREF | 39.8490 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0300 |

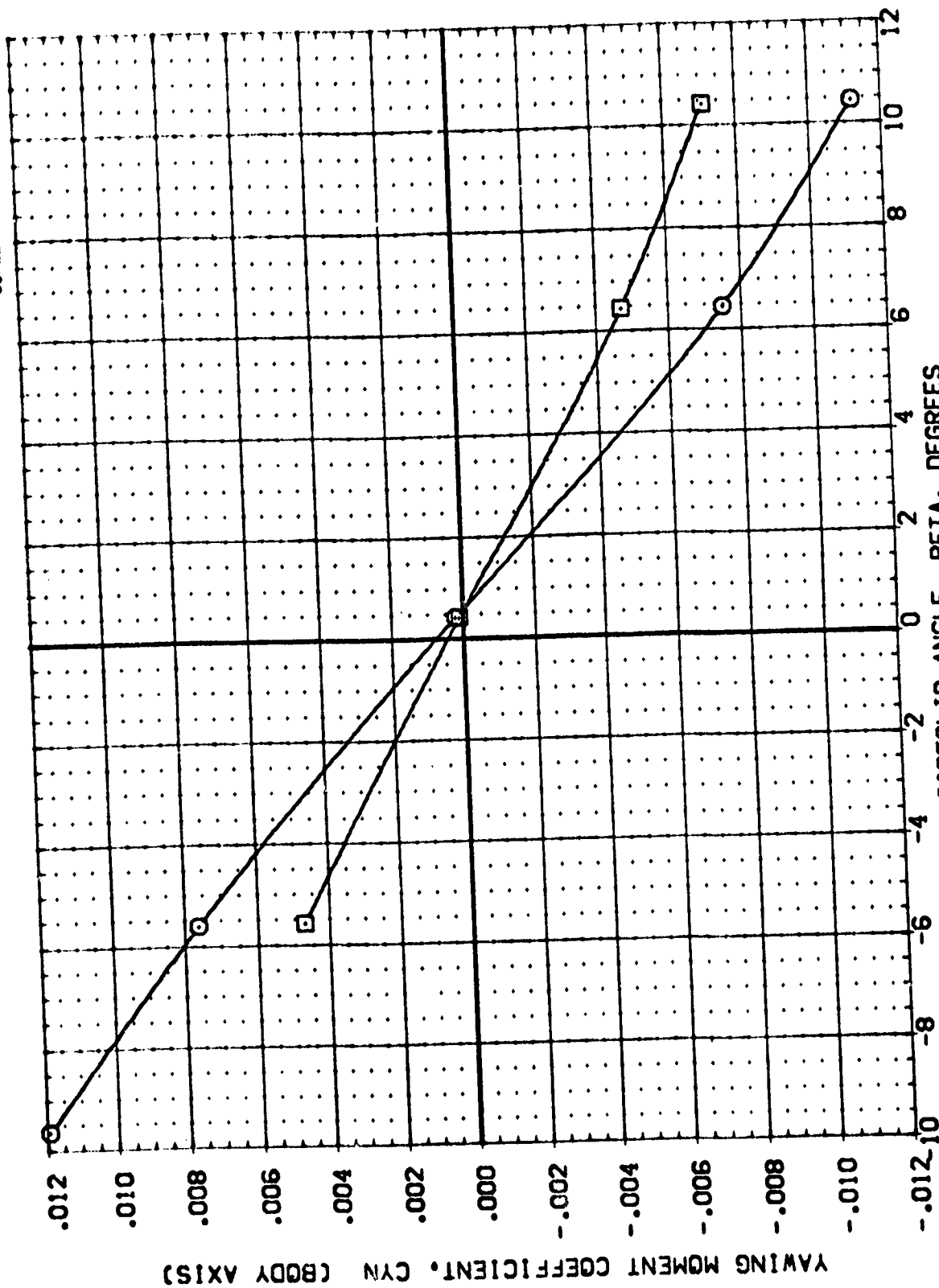


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(RBQ022)

AMES 87-7C7-0A12 02A

| | | | | | |
|--------|-------|--------|-------------------|---------|--------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | .000 |
| □ | 2.498 | RUDDER | 20.000 | RJOF LR | 40.000 |
| □ | 3.502 | | | | |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.42°C | SCALE |
| LREF | 39.845C | |
| BREF | 39.845C | |
| X-REF | 32.300C | |
| Y-REF | .000C | |
| Z-REF | .000C | |
| SCALE | .000C | |

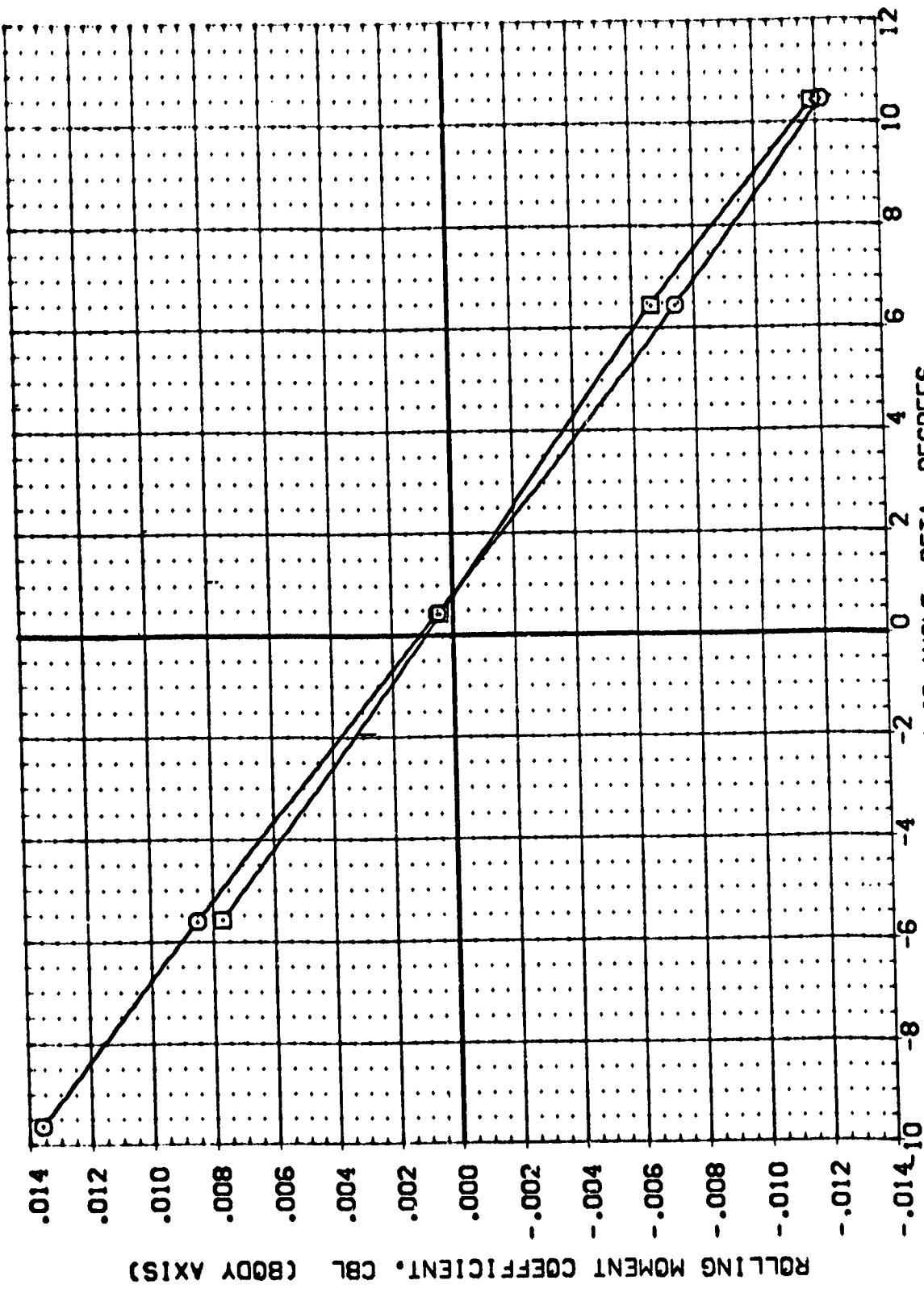


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(R80022)

AMES 87-707-CA12 02A

| SYMBOL | | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| WACH | 2.498 | ALPHA | 20.000 |
| WREF | 3.502 | ELEVON | .000 |
| | | RUDFLR | 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|-------|
| SREF | 2.4210 | SCALE |
| LREF | 39.8450 | |
| BREF | 39.8450 | |
| XREF | 32.3000 | |
| YREF | .0000 | |
| ZREF | .0000 | |
| SCALE | .0300 | |

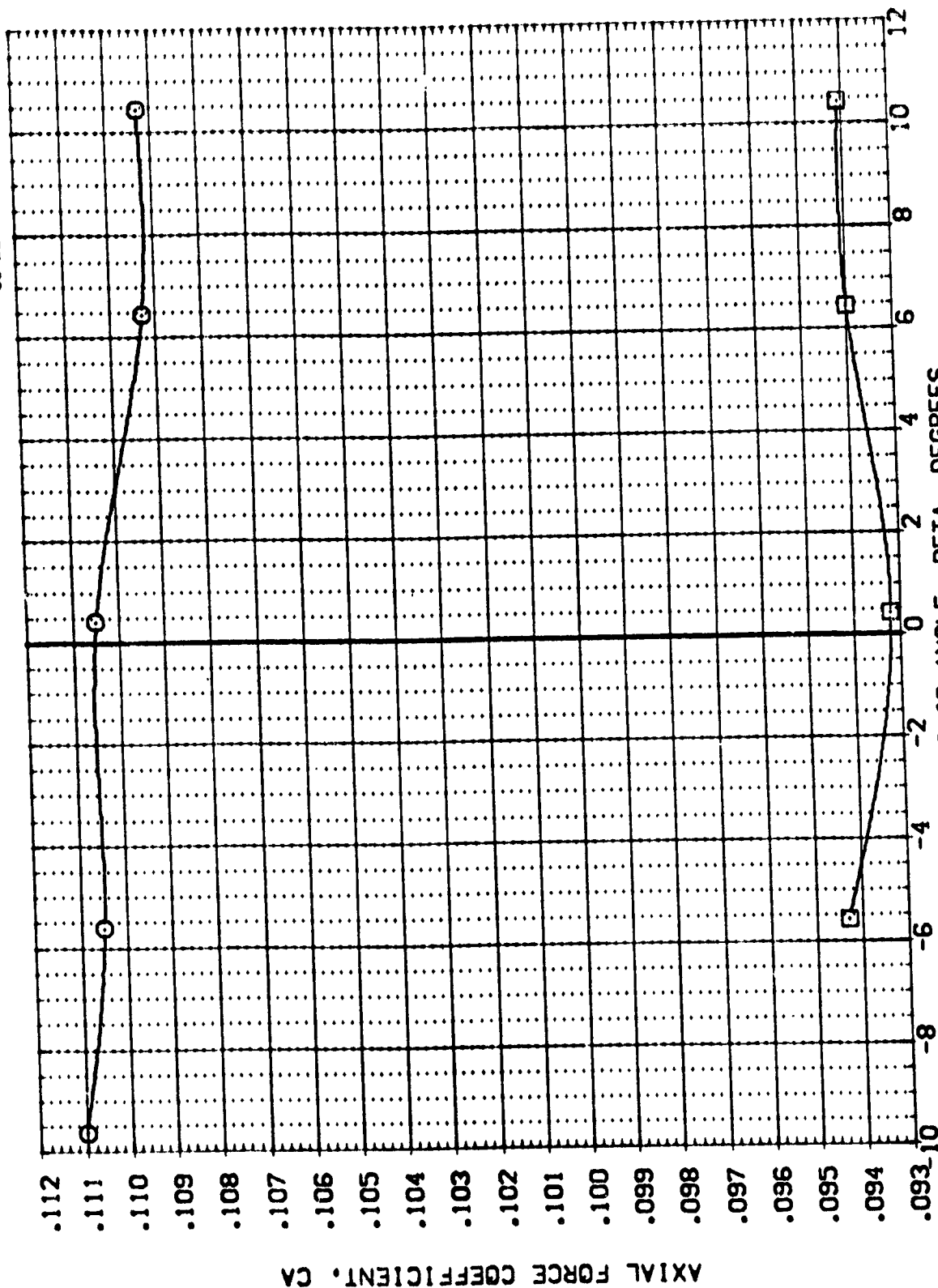


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

AMES 87-707-0A12 02A

(R90022)

REFERENCE INFORMATION
 SREF 2.4212
 LREF 39.8450
 XREF 39.8450
 YREF 37.3000
 ZREF 37.3000
 SCALE .0300

PARAMETRIC VALUES
 MACH 2.498 ALPHA 20.000 ELEVON .000
 3.502 RUDDER .000 RUOFLR 40.000

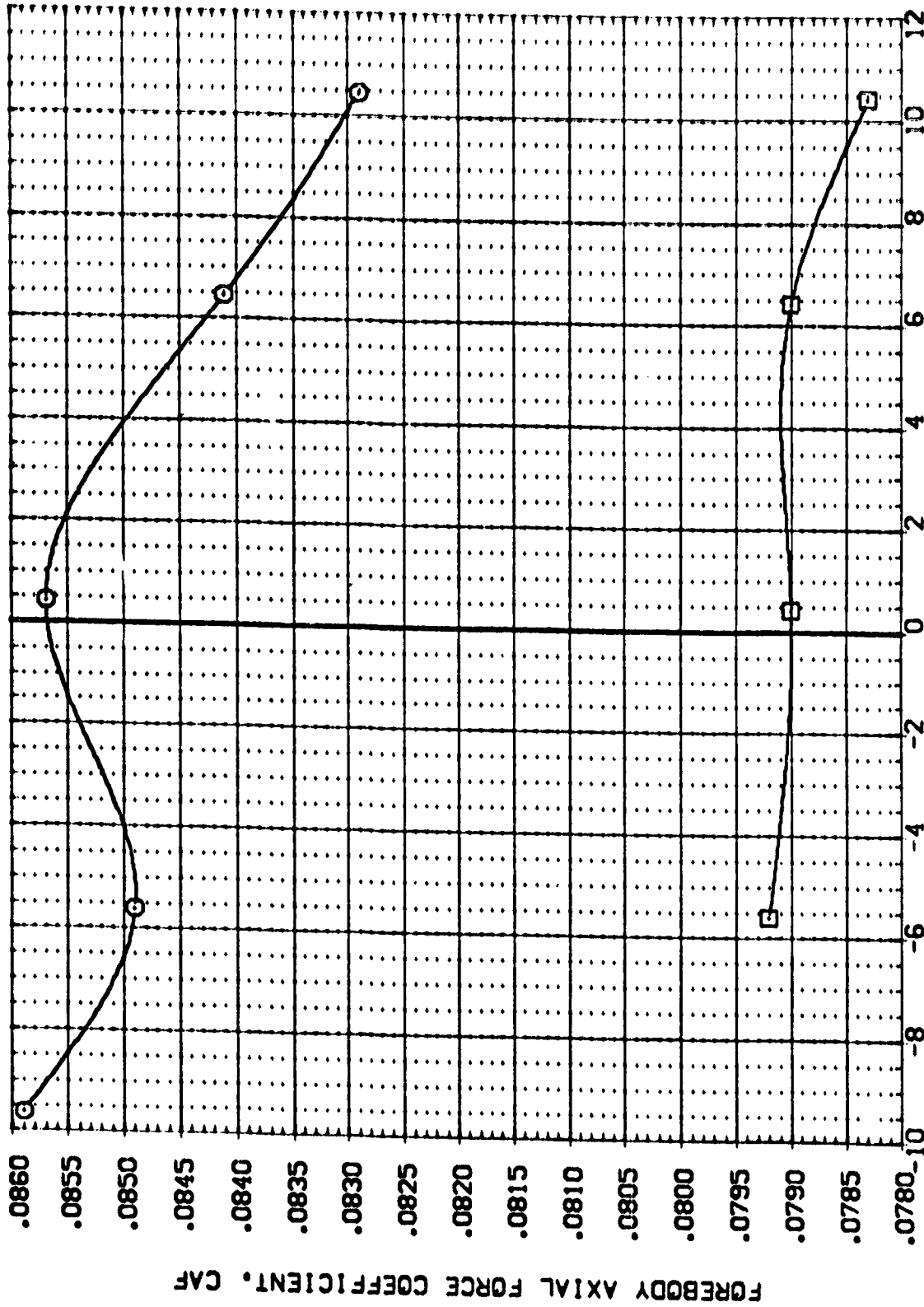


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(R33022)

AVES 87-707-CA12 C2A

SYMBOL WACH ALPHA RUDER PARAMETRIC VALUES
 2.498 3.502 20.000 .000 ELEVON 40.000
 3.502 20.000 .000 RUDER 40.000

REFERENCE INFORMATION
 SPEC 2.4210
 REF 39.8490
 BREF 39.8490
 XREF 32.0000
 YREF 32.0000
 ZREF 32.0000
 SCALE 1.000

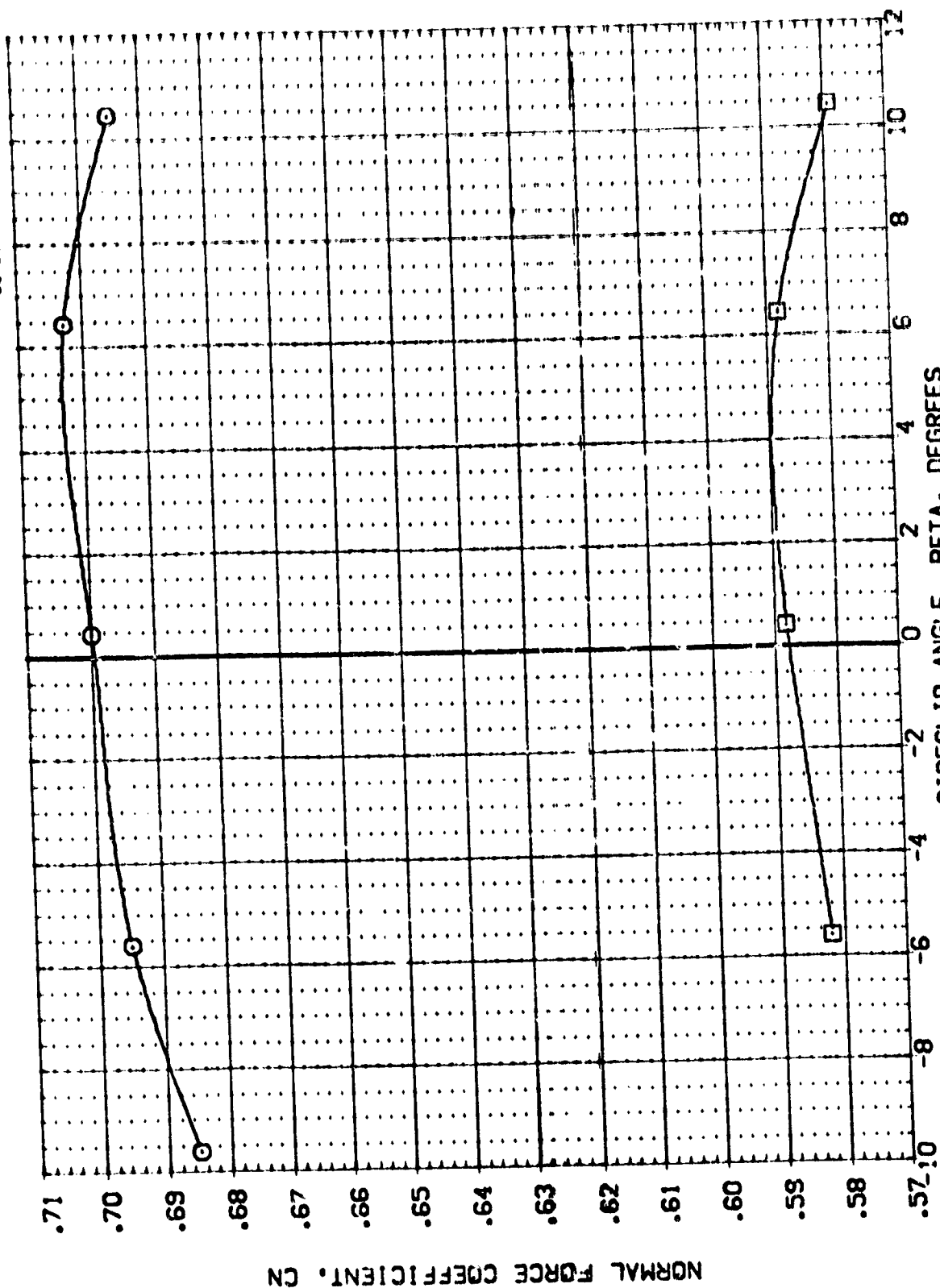


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(R8C022)

AVES 87-707-CA12 G2A

| SYMBOL | | MACH | | PARAMETRIC VALUES | |
|--------|--|-------|--------|-------------------|--------|
| 100 | | 2.498 | ALPHA | 20.000 | ELEVON |
| | | 3.502 | RUDDER | .000 | RUFLR |
| | | | | 40.000 | |

REFERENCE INFORMATION
 SREF 2.4210
 REF 39.8150
 BRG 39.8150
 XPRD 32.3000
 YPRD 1.0000
 ZPRD 1.0000
 SCALE 1.000

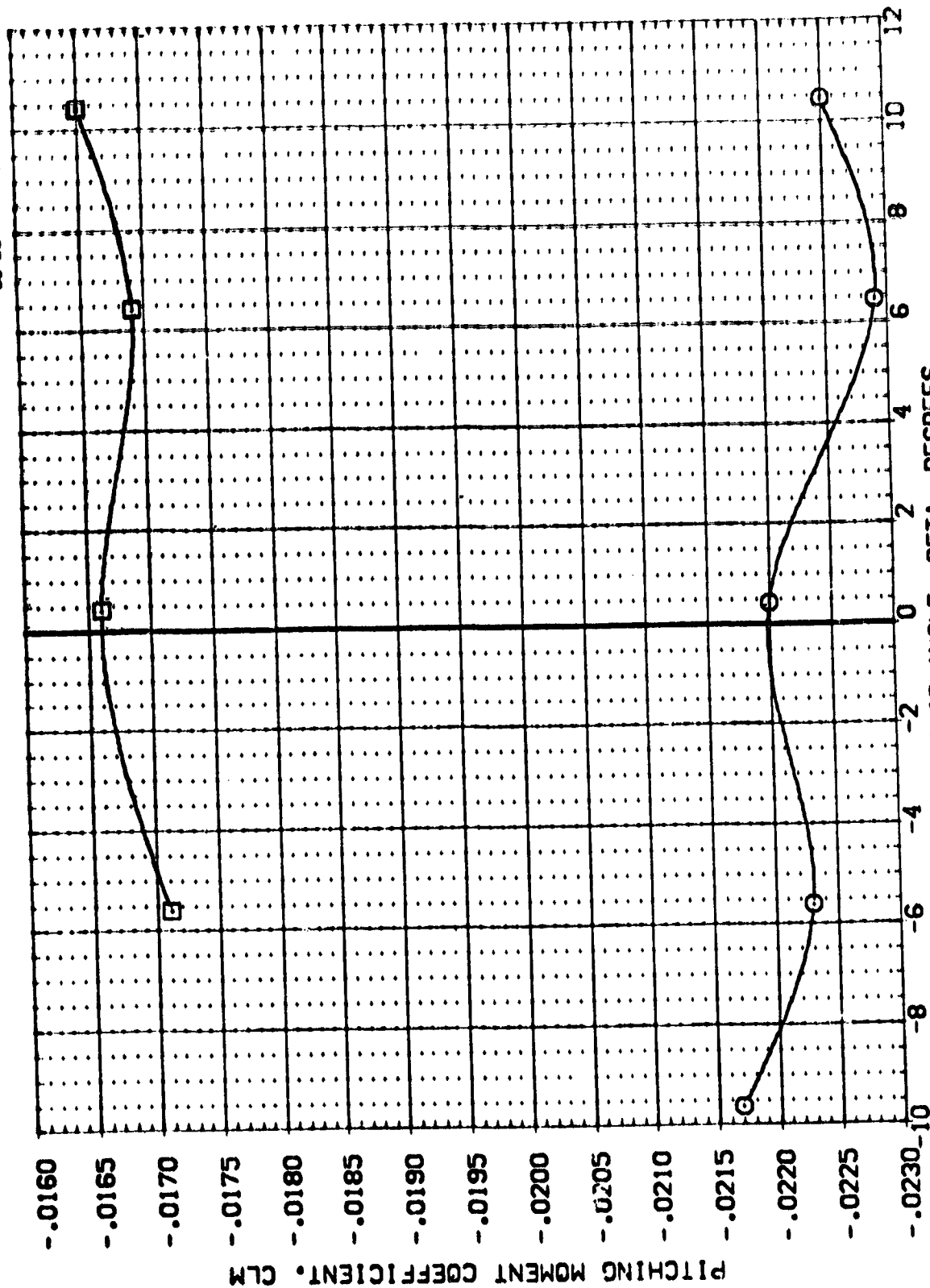


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

32A

108-15 (C) 1

2.49
3.50

ALPHA
DOOR

| PARAMETRIC VALUES | ELEVATION | POFFET |
|-------------------|-----------|--------|
| 20.000 | | |
| .000 | | |

200. 23

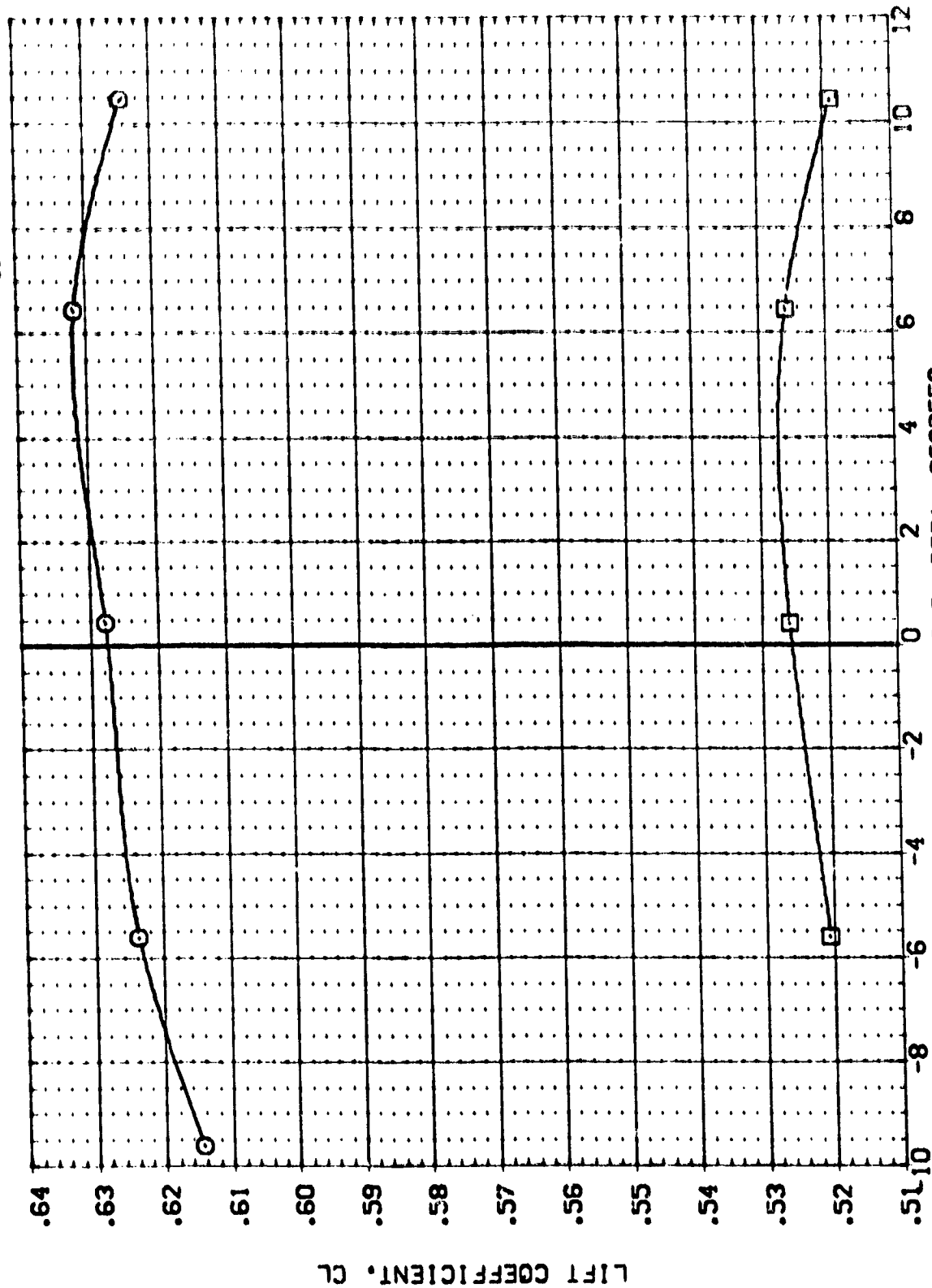
[illegible]

FIG. 70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5, 3.5

(RB0022)

AMES 87-707-9A12 02A

SYMBOL MACH ALPHA RUDER
 2.498 3.532
 20.000 .000
 20.000 ELEVON 40.000
 .000 RUDFLR

REFERENCE INFORMATION
 SREF 2.4210
 LREF 39.8490
 BREF 39.8490
 YGRP 32.3000
 VGRP .0000
 ZGRP .0000
 SCALE .0300

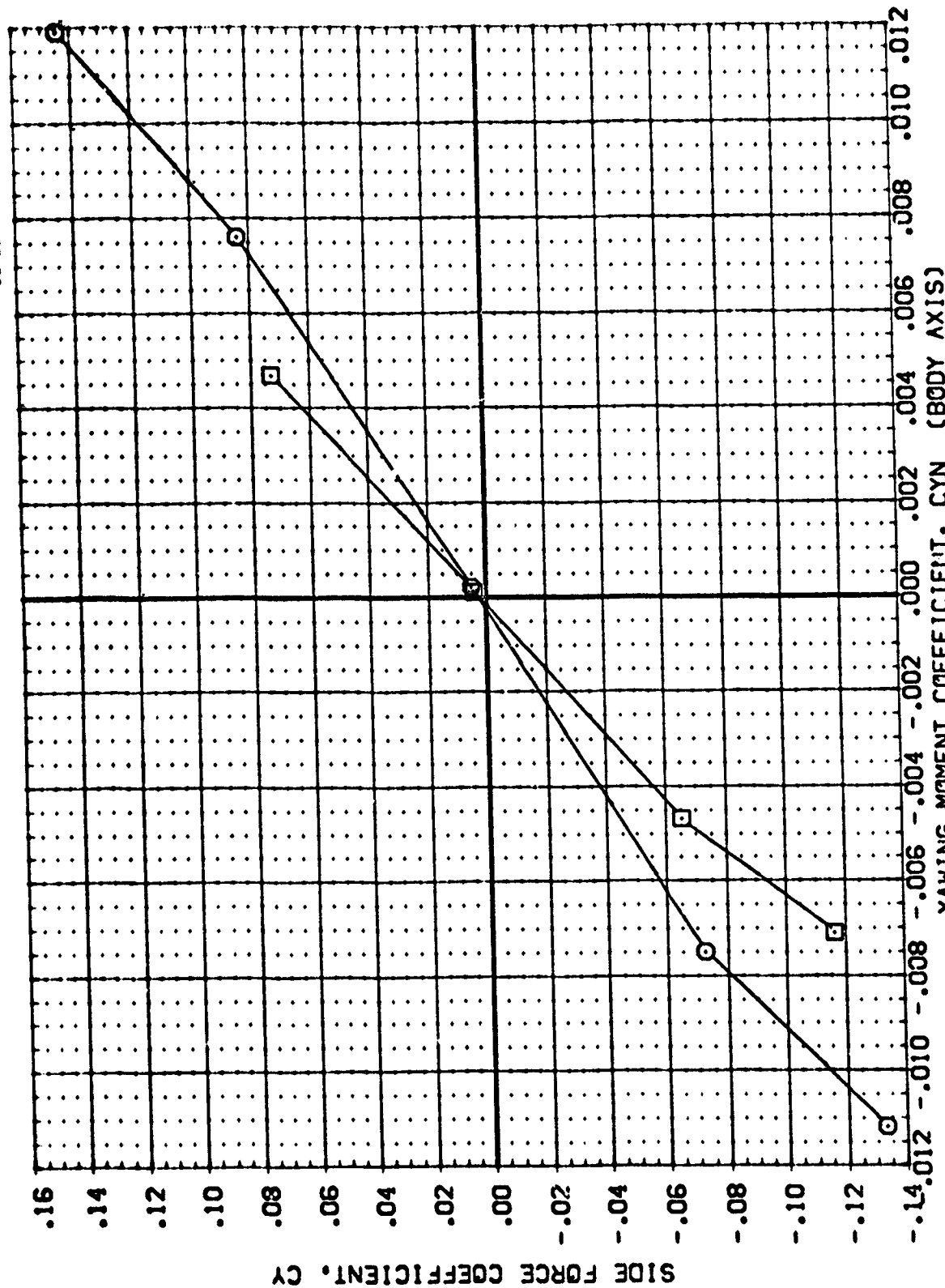


FIG.70 ORBITER LAT-DIR. AERO DATA, ALPHA=20 DEGS., MN=2.5,3.5

(RBG023)

AVES 87-707-CA:2 02A

| SYMBOL | MACH | PARAMETRIC VALUES | | ELEVON | RUDER | CY |
|--------|-------|-------------------|--------|--------|-------|--------|
| | | ALPHA | RUDDER | | | |
| | 2.498 | 15.000 | | | | .000 |
| | 3.502 | | | | | 40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| | SC.FT. |
| SREF | 2.4210 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XMRP | 32.3000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0300 |

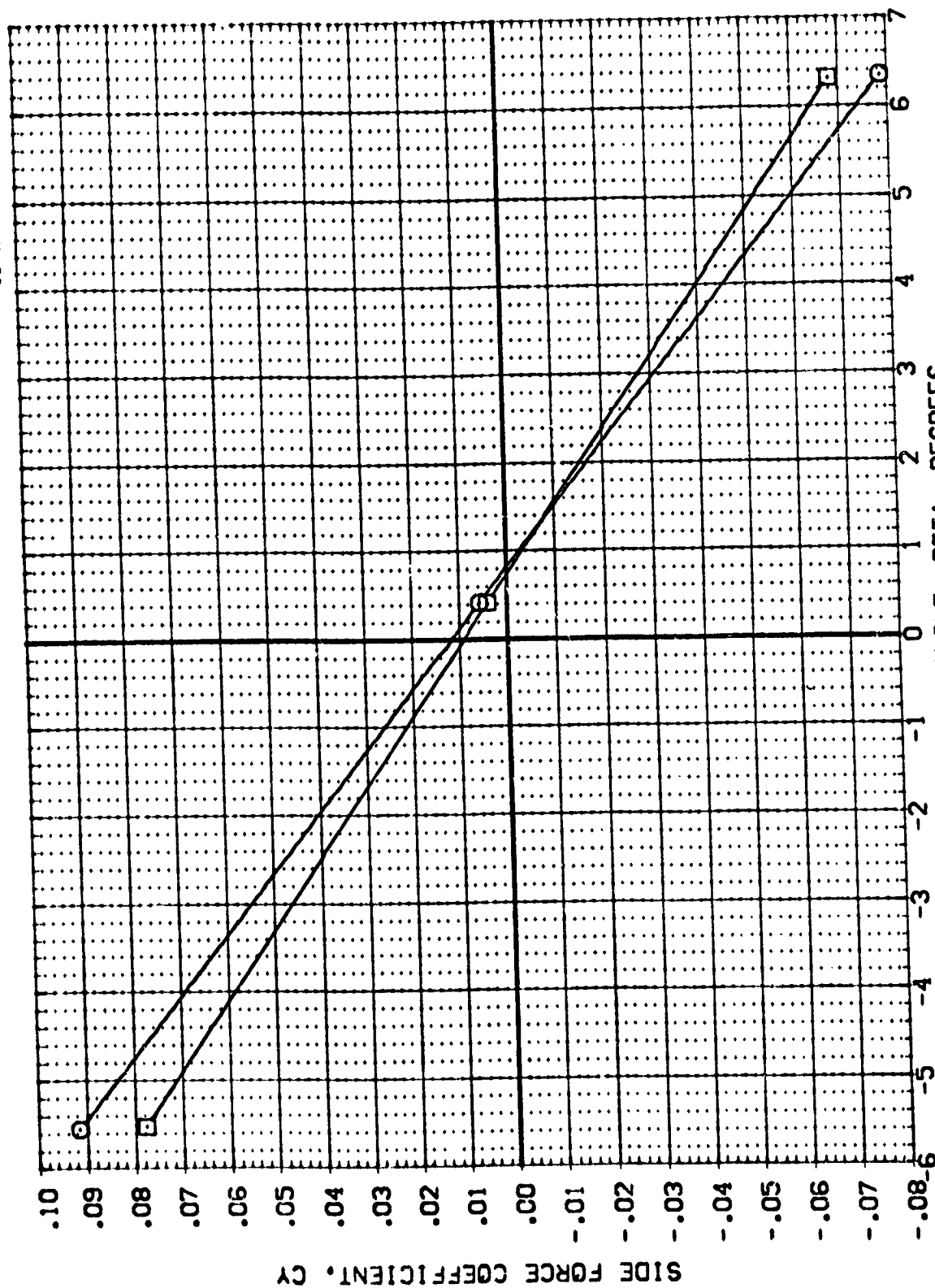


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

AVES 87-707-CA12 02A

(R30023)

| SYMBOL | | MACH | | PARAMETRIC VALUES | |
|--------|-------|--------|--------|-------------------|--------|
| | | | | | |
| □ | 2.498 | ALPHA | 15.000 | ELEVON | .000 |
| □ | 3.502 | RUDDER | .000 | RUOFLR | 40.000 |

REFERENCE INFORMATION
 SREF 2.4210 SQ.FT.
 LREF 39.849C
 BREF 39.849C
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

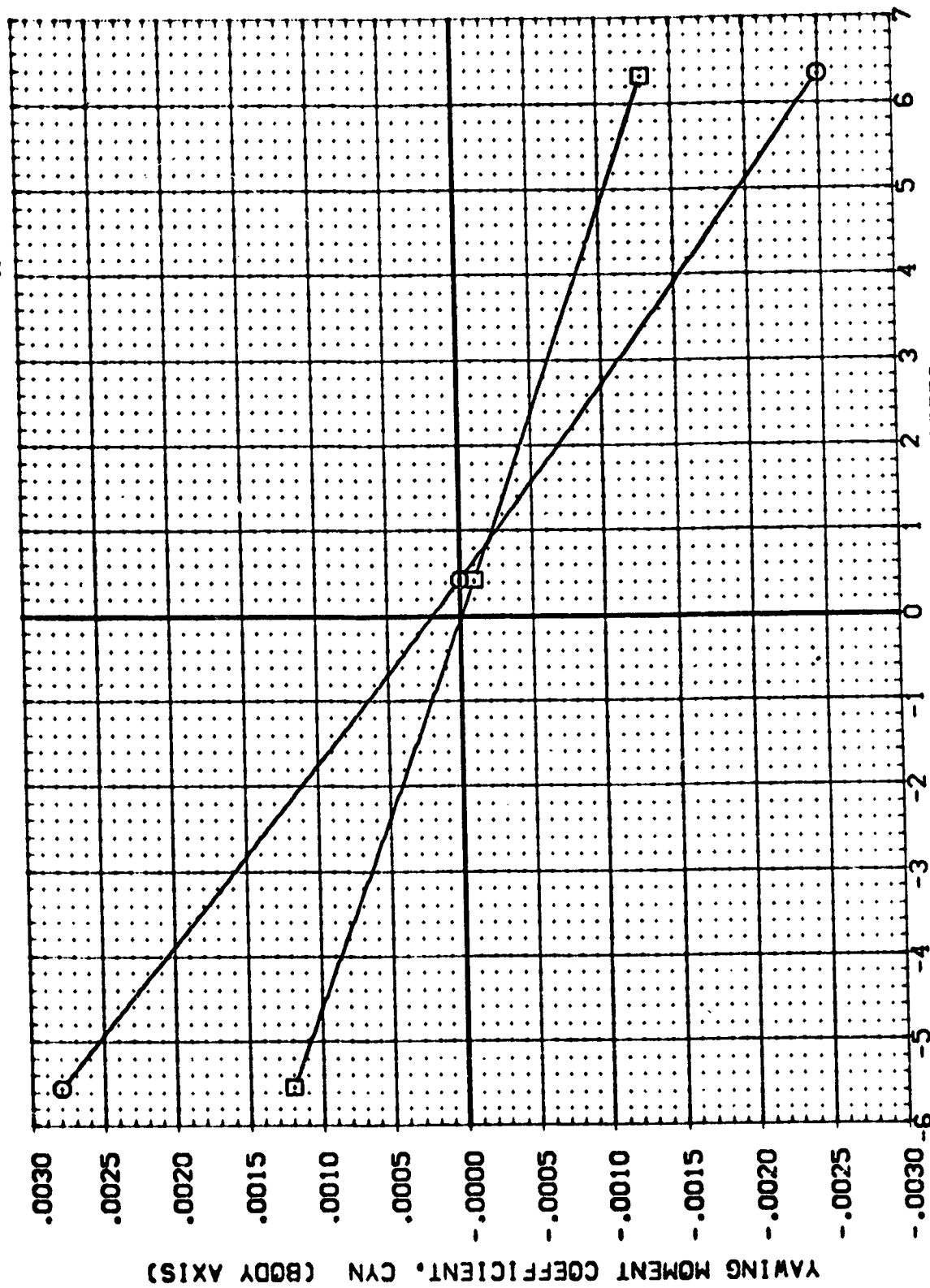


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5
 SIDESLIP ANGLE, BETA, DEGREES

(R8Q023)

AMES 87-707-0A12 02A

| | | | | | | |
|--------|-------|-------|-------------------|--------|-------|--------|
| SYMBOL | MACH | ALPHA | PARAMETRIC VALUES | ELEVON | RUFLR | RUFLR |
| ○ | 2.498 | 3.502 | 15.000 | .000 | .000 | .000 |
| □ | 3.502 | | | | | 40.000 |

REFERENCE INFORMATION

| | | |
|-------|---------|---------|
| SREF | 2.4210 | SC.F.T. |
| LREF | 39.8490 | |
| BREF | 39.8490 | |
| XMRP | 32.3000 | |
| YMRP | .0000 | |
| ZMRP | .0000 | |
| SCALE | .0300 | |

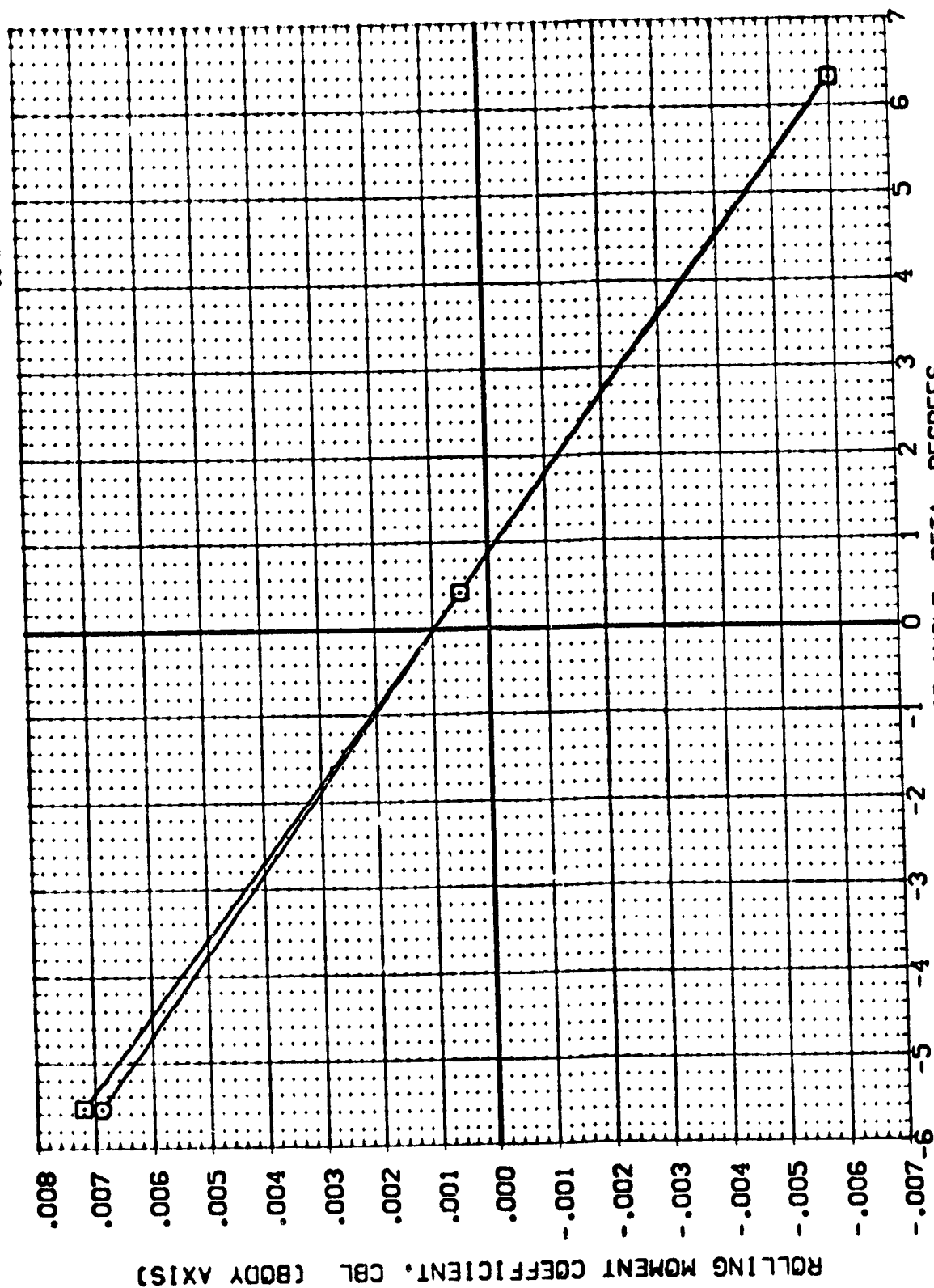


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

(RB0023)

AVES 87-707-0A12 02A

| SYMBOL | WACH | PARAMETRIC VALUES | |
|--------|-------|-------------------|--------|
| | | ALPHA | ELEVON |
| □ | 2.498 | 15.000 | .000 |
| □ | 3.502 | .000 | 40.000 |

REFERENCE INFORMATION

| | SC.F.T. |
|-------|---------|
| SREF | 2.4213 |
| LREF | 39.8450 |
| BREF | 39.8450 |
| XMRP | 30.0000 |
| YMRP | .0000 |
| ZMRP | .0000 |
| SCALE | .0300 |

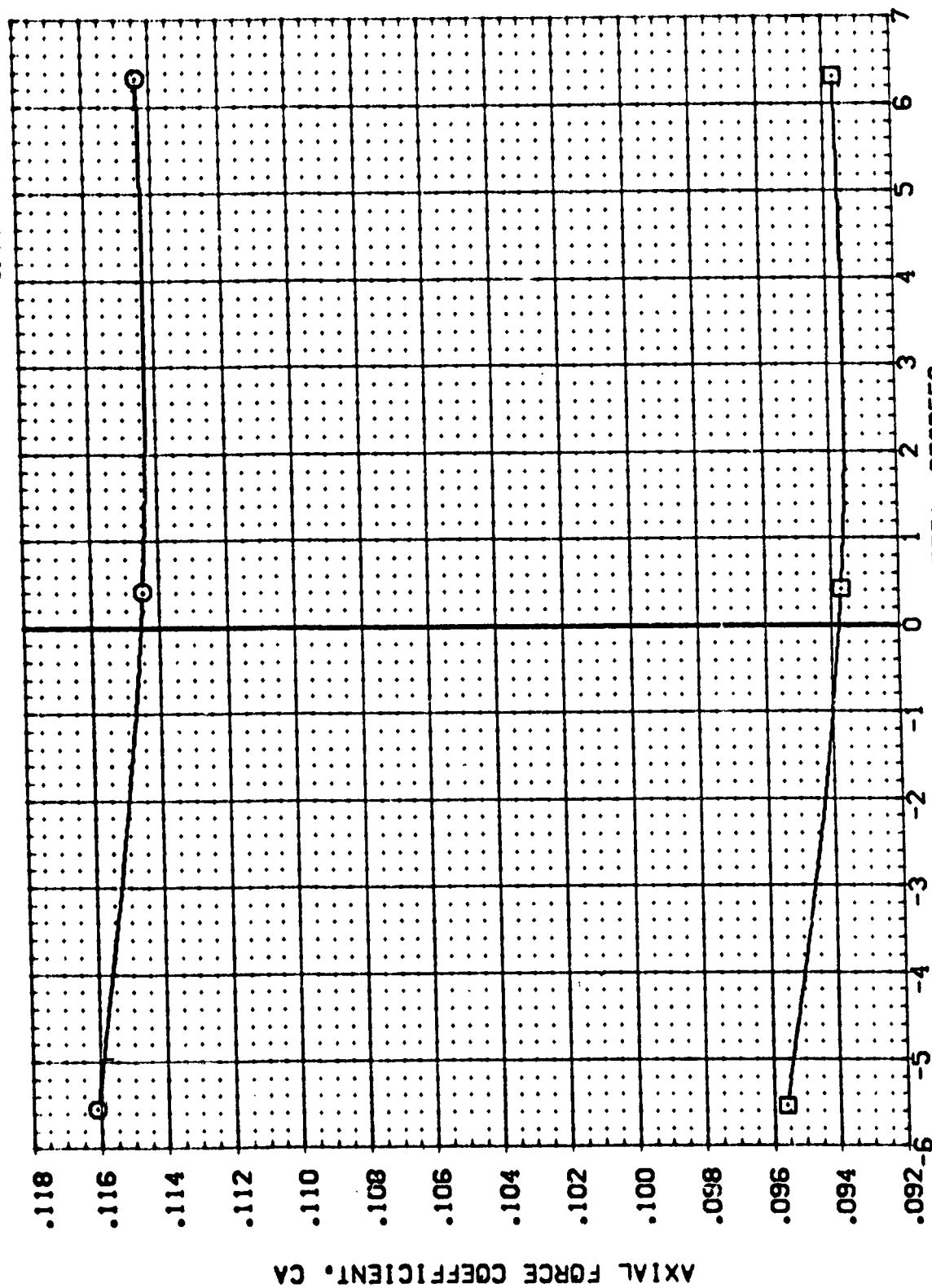


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

(RB0023)

AVES 87-707-CA12 02A

SYMBOL MACH ALPHA RUDDER
2.498
3.502

PARAMETRIC VALUES
15.000 ELEVON
.000 RUDFLR
40.000

REFERENCE INFORMATION
SREF 2.4213
LREF 39.8490
BREF 39.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

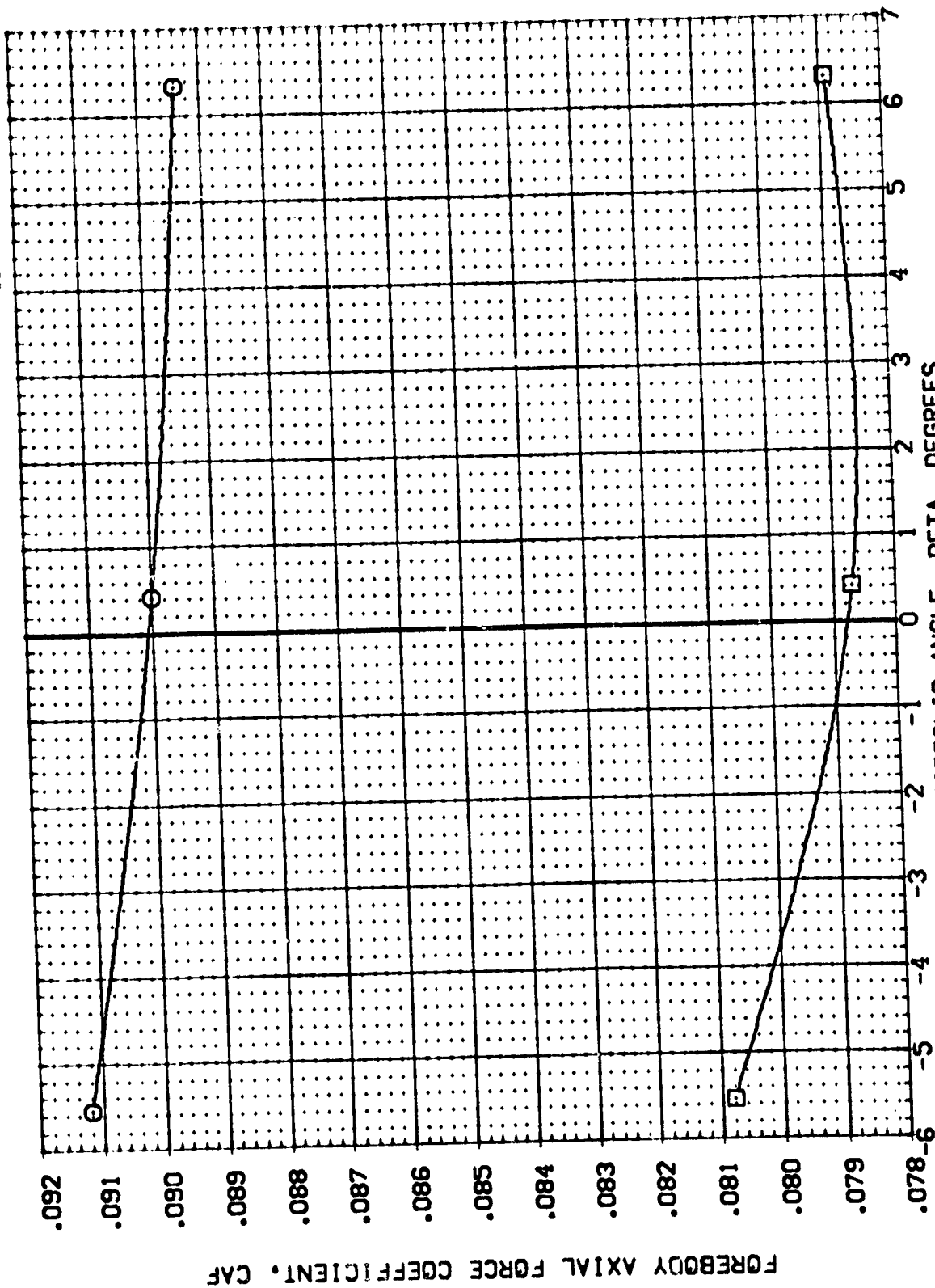


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

(R80023)

AMES 87-707-CA:2 02A

SYMBOL MACH ALPHA RUDER PARAMETRIC VALUES
□ □ 2.498 3.502 .000 .000 ELEVON .000
RJOELR 40.000

REFERENCE INFORMATION
SREF 2.421C
LREF 39.849C
BREF 39.849C
YARP 32.300C
ZARP .000C
SCALE .030C

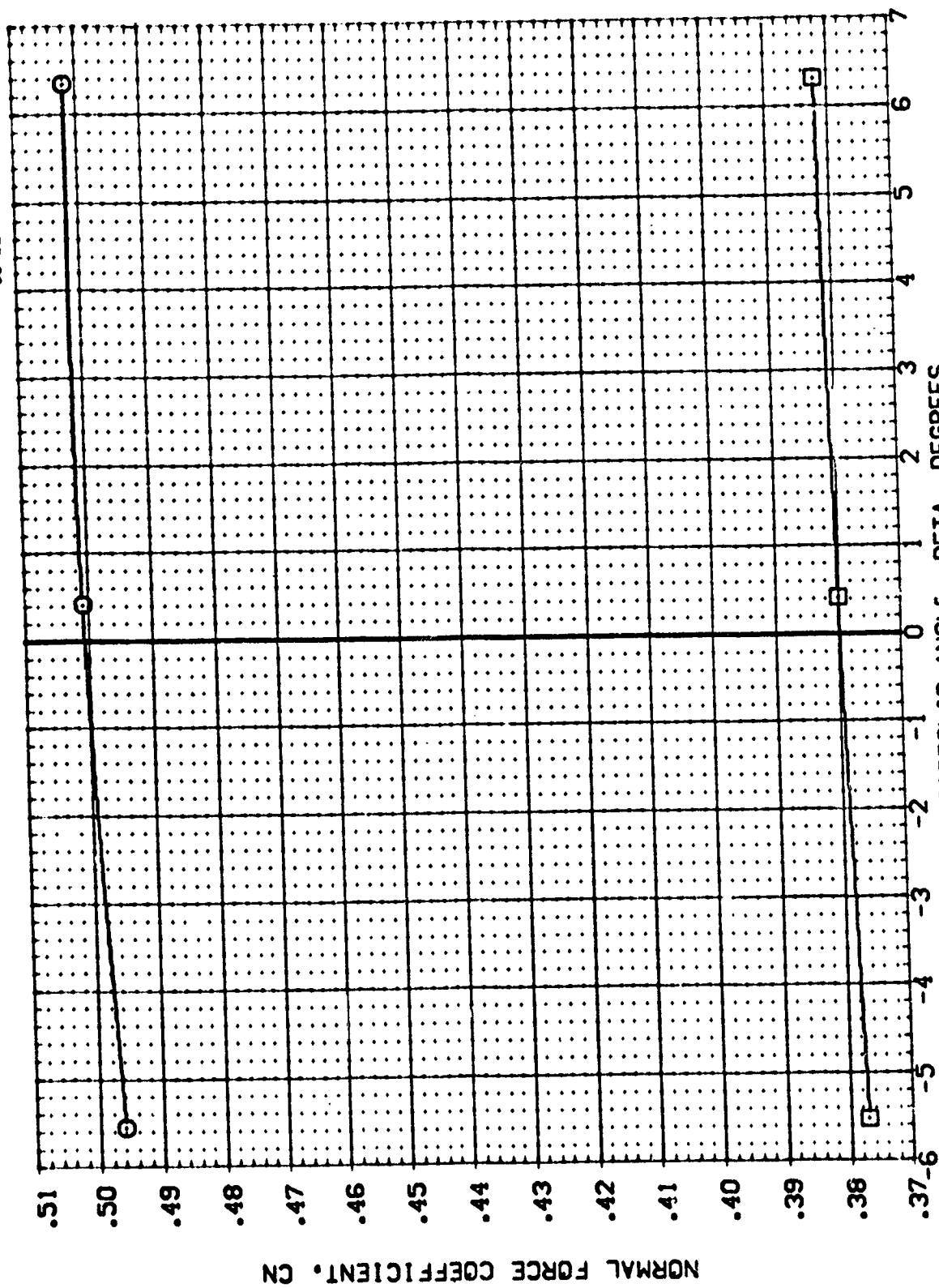


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

17000023)

AVES 87-707-CA:2 02A

SYMBOL WACH
2.498
3.502

PARAMETRIC VALUES
ALPHA 15.000
ELEVON .000
RUDDER .000
RUDFLR 40.000

REFERENCE INFORMATION
SPREF 2.4210
LREF 29.8490
BRF 33.8490
XMRP 32.3000
YMRP .0000
ZMRP .0000
SCALE .0300

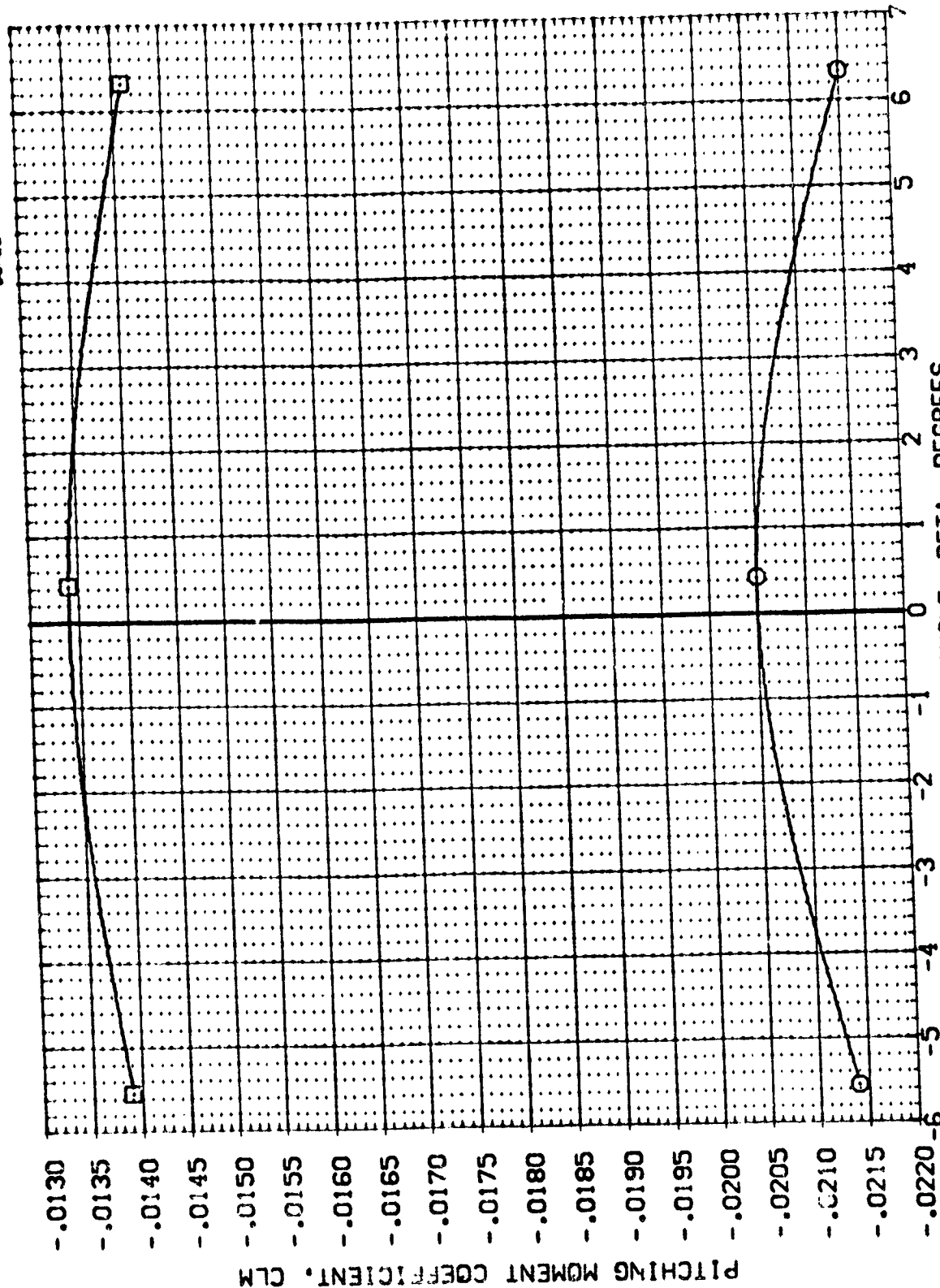


FIG. 71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5,3.5

[RB0023]

AMES 87-707-QA12 02A

REFERENCE INFORMATION
 SREF 2.4210 SC.FT.
 LREF 39.8490
 BREF 39.8490
 XMRP 32.3000
 YMRP .0000
 ZMRP .0000
 SCALE .0300

PARAMETRIC VALUES
 MACH 2.498 ALPHA 15.000 ELEVON .000
 3.502 RUDDER .000 RUFLR 40.000

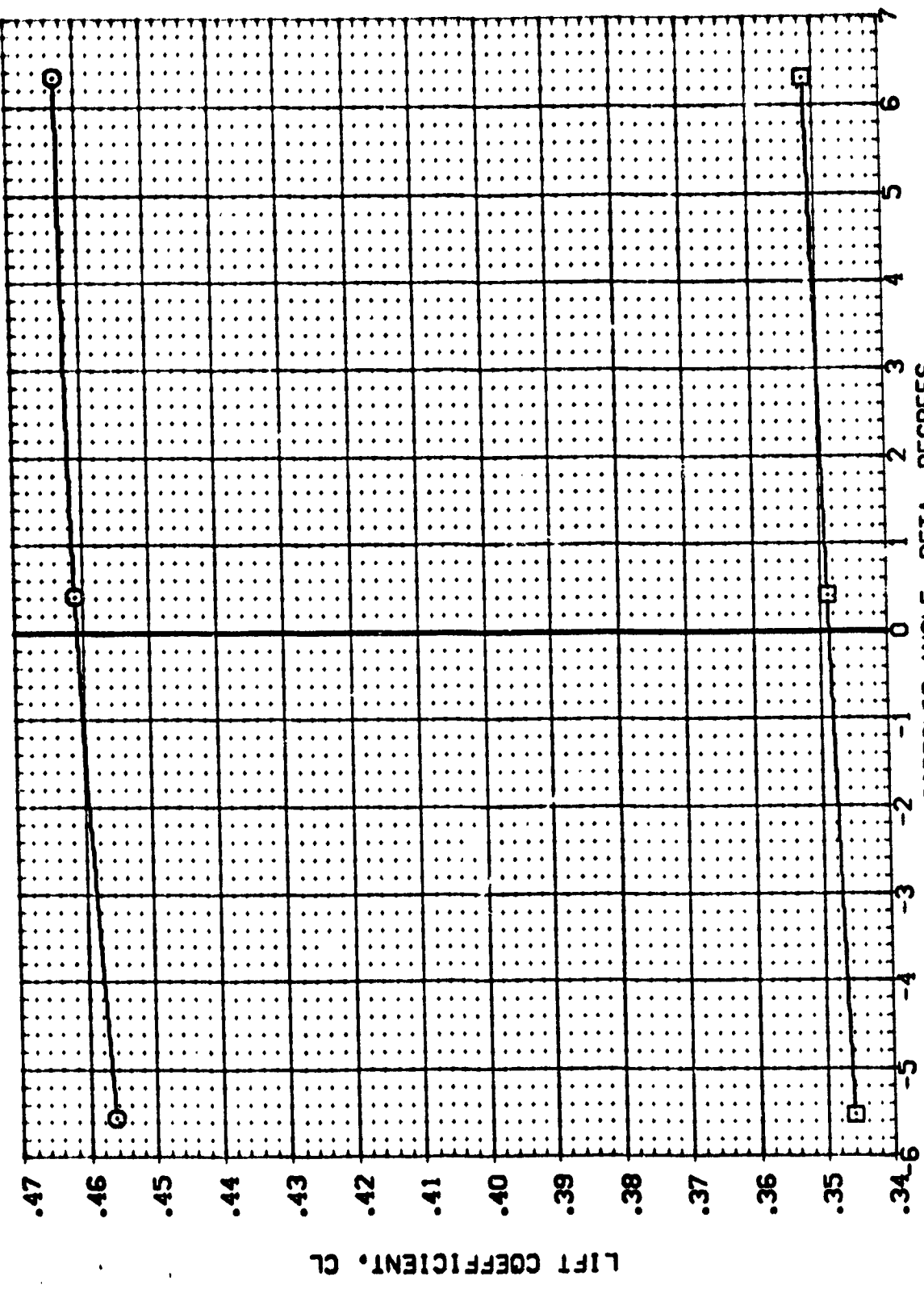


FIG.71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5, 3.5

| SYMBOL | WACH | ALPHA | RODER | PARAMETRIC VALUES |
|--------|-------|-------|-------|---------------------------------------|
| OL | 2.499 | | | 15.000 ELEVON
.000 ROELR
40.000 |

| REFERENCE INFORMATION | |
|-----------------------|---------|
| SREF | 2.4210 |
| LREF | 39.8490 |
| BREF | 39.8490 |
| XPRD | 32.3000 |
| YPRD | .0000 |
| ZPRD | .0000 |
| SCALE | .0300 |

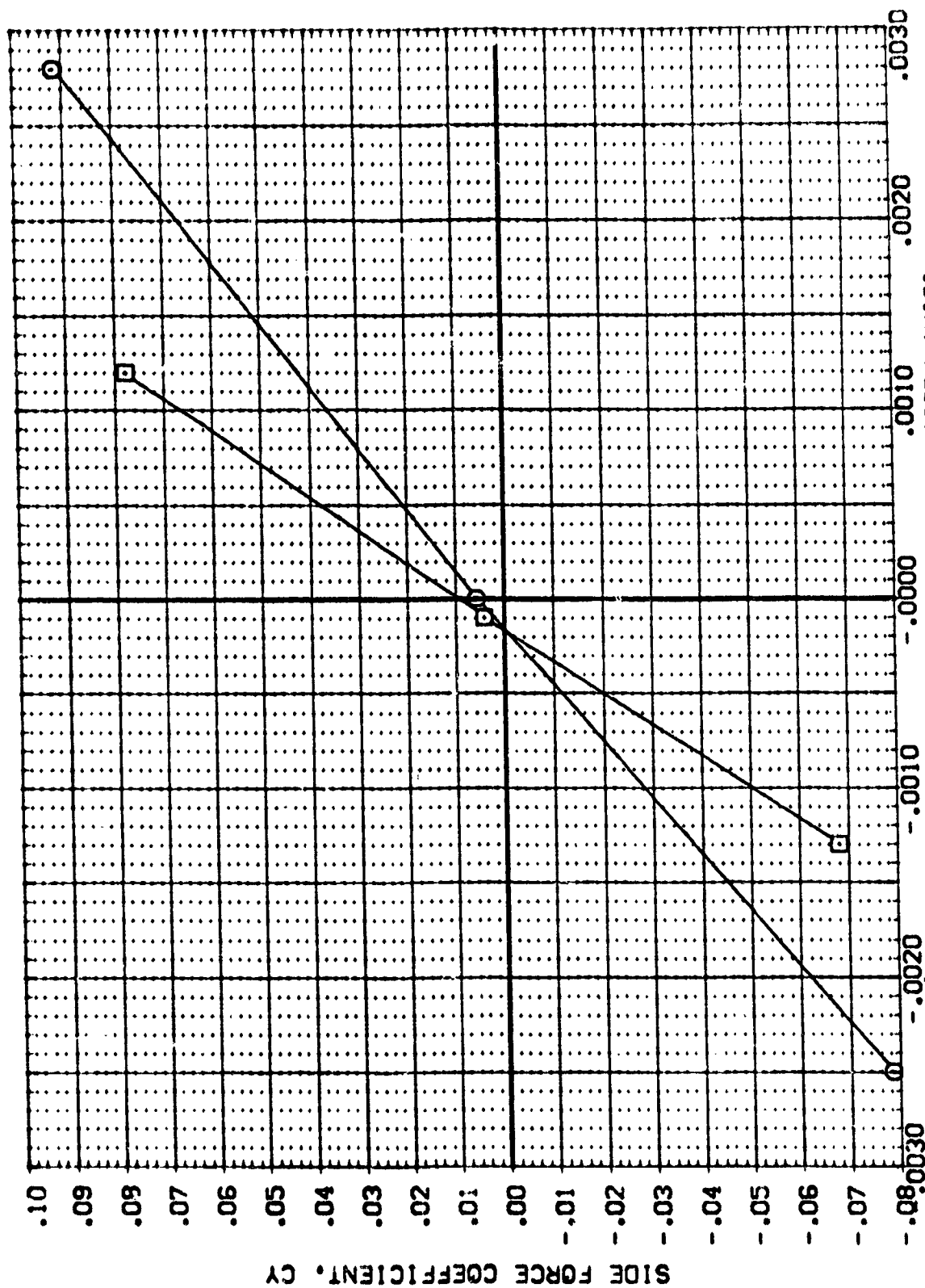


FIG. 71 ORBITER LAT-DIR. AERO DATA, ALPHA=15 DEGS., MN=2.5, 3.5

APPENDIX
TABULATED SOURCE DATA

Plotted data listings available on request
from the Data Management System.

DATE 13 SEP 73 (RBP001) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0412A
AMES 11-707 0412 02A

PARAMETRIC DATA

BETA = .000 ELEVON = .000
RUDDER = .000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 94.FT.
YREF = 39.8490 IN.
ZREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 119/ 0 RN/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|---------|--------|---------|---------|
| .600 | -4.4:0 | -.18400 | .00130 | .04390 | .01380 | -.00100 | -.00020 | .00310 | -.00730 | .05020 |
| .600 | .030 | .02400 | .00370 | .05100 | .02220 | -.00080 | -.00020 | .00330 | .02760 | .02860 |
| .600 | 5.030 | .27100 | -.00180 | .03950 | .01090 | -.00090 | -.00040 | .00660 | -.00680 | .02870 |
| .600 | 10.040 | .54100 | -.00440 | .01830 | -.01040 | -.00070 | -.00090 | .00930 | -.00810 | .02870 |
| .600 | 15.020 | .78900 | -.00920 | .03730 | .00180 | -.00230 | -.00110 | .01060 | -.01170 | .03350 |
| .600 | 20.000 | 1.03400 | -.01600 | .04510 | .00200 | .00010 | .00020 | .00880 | -.01480 | .04320 |
| .600 | 22.580 | 1.19300 | -.01240 | .04490 | -.00440 | -.00080 | .00060 | .01030 | -.01030 | .04930 |
| | GRADIENT | .04685 | -.00014 | .1160 | .00189 | .00005 | .00000 | .00005 | .00786 | -.00032 |

RUN NO. 125/ 0 RN/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|---------|--------|---------|---------|
| .905 | -4.560 | -.22900 | .00640 | .06500 | .03140 | -.00190 | .00100 | .00000 | -.02850 | .03350 |
| .905 | -.010 | .04800 | -.00340 | .07290 | .04030 | -.00180 | .00050 | .00240 | -.07040 | .03260 |
| .905 | 4.980 | .30800 | -.00630 | .06950 | .03920 | -.00180 | .00030 | .00470 | -.02060 | .03030 |
| .905 | 9.990 | .54900 | -.00890 | .07340 | .04180 | -.00140 | -.00060 | .00840 | -.01630 | .03360 |
| .905 | 14.990 | .80800 | -.01900 | .08770 | .04420 | -.00070 | -.00060 | .00740 | -.02350 | .04360 |
| .905 | 20.020 | 1.04600 | -.01750 | .09320 | .04150 | .00030 | .00010 | .00430 | -.01670 | .05170 |
| .905 | 25.040 | 1.12700 | .01080 | .10660 | .02770 | -.00120 | -.00060 | .00890 | .00960 | .07880 |
| | GRADIENT | .05581 | -.00132 | .00045 | .00080 | .00001 | -.00007 | .00049 | .00798 | -.00035 |

DATE 13 SEP 75

TABULATED SOURCE FORCE DATA-0A12A

1629002 (07 MAY 75)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

YMRP = 32.3000 IN.

YMRP = .0000 IN.

ZMRP = .0000 IN.

ALPHA = .000
RUDDER = .000
ELEVON = .000
RUCKER = .000

PARAMETRIC DATA

RUN NO. 120/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .598 | -10.010 | .04600 | -.00590 | .04300 | .01020 | -.00020 | -.00430 | .19460 | -.12980 | .03280 |
| .598 | -4.960 | .04500 | -.00100 | .04820 | .01810 | -.00060 | -.00270 | .09990 | -.02340 | .03510 |
| .598 | 5.230 | .02920 | -.00120 | .04830 | .01670 | -.00110 | .00280 | -.09560 | -.04350 | .03160 |
| .598 | 10.370 | .03300 | -.00510 | .04260 | .00790 | -.00010 | .00430 | -.19370 | -.15170 | .03510 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 |

RUN NO. 126/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .904 | -10.150 | .02700 | -.00590 | .07220 | .03280 | -.00610 | -.00750 | .22180 | -.22310 | .03950 |
| .904 | -5.040 | .04900 | -.00480 | .07200 | .03770 | -.00380 | -.00630 | .12100 | -.09670 | .03430 |
| .904 | 5.290 | .04200 | -.00550 | .07030 | .03570 | .00200 | .00590 | -.11790 | -.13000 | .03470 |
| .904 | 10.500 | .01600 | -.00550 | .06340 | .02970 | .00480 | .00710 | -.21560 | -.35250 | .03970 |
| | GRADIENT | .00794 | -.00104 | .01329 | .00675 | .00038 | .00112 | -.02096 | -.02457 | .00655 |

PAGE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

ANES 11-707 0A12 02A

PAGE 3

(287003) (07 MAY 73)

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .030E SCALE

ALPHA = 5.000 ELEVON = .000
 RUDDER = .000 RUDFLR = .000

PARAMETRIC DATA

RUN NO. 121/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CLF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|--------|---------|--------|---------|---------|---------|---------|---------|--------|
| .596 | -10.080 | .27700 | -.03670 | .03390 | -.00030 | .00360 | -.00470 | .19865 | -.02440 | .03440 |
| .596 | -4.990 | .28200 | -.03280 | .03780 | .00700 | .00070 | -.00290 | .10210 | -.01000 | .00220 |
| .596 | 5.190 | .26900 | -.00310 | .03860 | .00700 | -.00230 | .00260 | -.09290 | -.01160 | .03180 |
| .596 | 10.330 | .27300 | -.00620 | .03420 | -.00070 | -.00360 | .00470 | -.13420 | -.02260 | .00550 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 |

RUN NO. 127/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .904 | -10.210 | .29000 | -.00950 | .07170 | .03240 | .00140 | -.00700 | .22220 | -.03270 | .03330 |
| .904 | -5.070 | .31100 | -.00730 | .06790 | .03450 | .00040 | -.00630 | .11780 | -.02350 | .03350 |
| .904 | 5.250 | .29800 | -.00700 | .06840 | .03520 | -.00350 | .00570 | -.10590 | -.02340 | .03320 |
| .904 | 10.430 | .27800 | -.00810 | .06980 | .03020 | -.00260 | .00760 | -.21050 | -.02310 | .03350 |
| | GRADIENT | .05676 | -.00133 | .01303 | .00673 | -.00067 | .00109 | -.02017 | -.00446 | .00632 |

DATE 13 SEP 73

TABULATED SOURCE F

32A

AXES

PAGE 4

(RBP004) (07 MAY 73)

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 36
 LREF = 39.8490 IN. YMRP =
 BREF = 39.8490 IN. ZMRP =
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
 RUDDER = .000 RUOFLR = .000

RUN NO. 122/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|---------|---------|---------|---------|---------|--------|
| .597 | -10.110 | .55600 | -.01000 | .01190 | -.02390 | .00870 | -.00400 | .20320 | -.01810 | .03580 |
| .597 | -5.020 | .56800 | -.00570 | .01490 | -.01820 | .00440 | -.00230 | .10550 | -.01070 | .03300 |
| .597 | 5.170 | .56100 | -.00660 | .01720 | -.01600 | -.00440 | .00060 | -.08720 | -.01170 | .03320 |
| .597 | 10.270 | .55300 | -.01070 | .01480 | -.02230 | -.00850 | .00280 | -.19180 | -.01810 | .03710 |
| | GRADIENT | .10851 | -.00128 | .00333 | -.00309 | -.00085 | .00012 | -.01687 | -.00226 | .00642 |

RUN NO. 128/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .902 | -10.230 | .53800 | -.01230 | .07530 | .03430 | .00840 | -.00500 | .20960 | -.02330 | .04100 |
| .902 | -5.070 | .54900 | -.00950 | .07560 | .03800 | .00460 | -.00460 | .10860 | -.01750 | .03560 |
| .902 | 5.230 | .54700 | -.01030 | .07480 | .03950 | -.00620 | .00390 | -.09680 | -.01880 | .03530 |
| .902 | 10.390 | .53100 | -.01190 | .07420 | .03480 | -.00760 | .00440 | -.20070 | -.02230 | .03950 |
| | GRADIENT | .10459 | -.00197 | .01430 | .00755 | -.00119 | .00075 | -.01851 | -.00359 | .00675 |

(RBP005) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
RUDDER = .000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 94.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 123/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|---------|---------|---------|---------|---------|--------|
| .599 | -10.090 | .76100 | -.01280 | .02910 | -.01110 | .01370 | -.00360 | .20280 | -.01640 | .04020 |
| .599 | -5.000 | .79900 | -.00970 | .03330 | -.00380 | .00530 | -.00210 | .10620 | -.01210 | .03710 |
| .599 | 5.180 | .76900 | -.01050 | .03130 | -.00430 | -.00710 | .00030 | -.08870 | -.01330 | .03570 |
| .599 | 10.290 | .77900 | -.01300 | .02470 | -.01450 | -.01140 | .00240 | -.19440 | -.01660 | .03920 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 |

RUN NO. 129/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .904 | -10.200 | .80100 | -.02090 | .08170 | .03530 | .00880 | -.00240 | .19780 | -.02610 | .04640 |
| .904 | -5.090 | .81900 | -.01950 | .08250 | .04010 | .00420 | -.00010 | .09410 | -.02360 | .04240 |
| .904 | 5.220 | .79800 | -.01870 | .08170 | .04040 | -.00540 | -.00330 | -.08040 | -.02350 | .04130 |
| .904 | 10.390 | .78800 | -.01980 | .08160 | .03860 | -.00320 | -.00040 | -.18650 | -.02510 | .04300 |
| | GRADIENT | .15287 | -.00358 | .01565 | .00774 | -.00103 | -.00006 | -.01540 | -.00450 | .00791 |

DATE 13 SEP 73 (RBP006) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREF = 2.4210 59.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 124/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|---------|---------|---------|--------|
| .599 | -10.030 | 1.09000 | -.02120 | .03920 | -.01110 | .01020 | -.00110 | .20660 | -.01940 | .04630 |
| .599 | -4.970 | 1.09100 | -.01680 | .03790 | -.00590 | .00370 | -.00040 | .10440 | -.01540 | .04370 |
| .599 | 5.210 | 1.07400 | -.01730 | .03800 | -.00380 | -.00390 | -.00070 | -.09050 | -.01610 | .04180 |
| .599 | 10.360 | 1.07000 | -.02040 | .03090 | -.01420 | -.00970 | .00130 | -.19830 | -.01990 | .04510 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 | .00000 |

RUN NO. 130/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|---------|--------|
| .902 | -10.110 | 1.03200 | -.01940 | .08550 | .03000 | .01490 | .01040 | .16410 | -.01880 | .05550 |
| .902 | -5.020 | 1.05000 | -.01630 | .08980 | .03440 | .00830 | .01000 | .07100 | -.01590 | .05940 |
| .902 | 5.260 | 1.03700 | -.01870 | .08840 | .03900 | -.00830 | -.01010 | -.06990 | -.01800 | .04930 |
| .902 | 10.430 | 1.01400 | -.01890 | .08290 | .03320 | -.01390 | -.01160 | -.15390 | -.01870 | .04970 |
| | GRADIENT | .19715 | -.00356 | .01681 | .00741 | -.00158 | -.00192 | -.01329 | -.00342 | .00937 |

(RBP007) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

ANES 11-707 0A12 02A

DATE 13 SEP 73

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8450 IN.
 BREF = 39.8450 IN.
 SCALE = .0300 SCALE

ALPHA = .005 ELEVON = .000

RUDDER = -10.000 RUDDFLR = .000

PARAMETRIC DATA

GRADIENT INTERVAL = -5.00/ 5.00

| RUN NO. | 131/ 0 | RV/L = 4.01 | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|-------------|--------|--------|---------|--------|---------|---------|--------|
| MACH | BETA | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
| .600 | -7.960 | -.00330 | .04660 | .01470 | -.00450 | .00490 | .13200 | -.09750 | .03190 |
| .800 | -3.940 | .00020 | .03110 | .02070 | -.00610 | .00700 | .03260 | .00530 | .03030 |
| .800 | .090 | .00120 | .03430 | .02460 | -.00580 | .00890 | -.02400 | .00900 | .02970 |
| .800 | 4.210 | -.00030 | .03260 | .02190 | -.00530 | .01060 | -.01030 | -.01170 | .03110 |
| .800 | 8.320 | -.00370 | .04810 | .01410 | -.00520 | .01290 | -.01870 | -.01440 | .03400 |
| GRADIENT | | -.00006 | .00018 | .00009 | .00010 | .00044 | -.01876 | -.00214 | .00010 |

GRADIENT INTERVAL = -5.00/ 5.00

| RUN NO. | 136/ 0 | RV/L = 4.52 | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|-------------|---------|---------|---------|---------|---------|---------|--------|
| MACH | BETA | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
| .902 | -8.090 | -.00450 | .07250 | .03450 | -.00660 | -.00390 | .16970 | -.08200 | .03800 |
| .902 | -4.000 | -.00350 | .07350 | .03930 | -.00560 | -.00200 | .08660 | -.08460 | .03420 |
| .902 | .090 | -.00330 | .07600 | .04290 | -.00360 | .00450 | -.00950 | -.07620 | .03390 |
| .902 | 4.260 | -.00370 | .07270 | .03810 | -.00230 | .01200 | -.01010 | -.03350 | .03460 |
| .902 | 8.440 | -.00460 | .07320 | .03360 | -.00070 | .01590 | -.02010 | -.02210 | .03970 |
| GRADIENT | | -.00002 | -.00010 | -.00015 | .00040 | .00170 | -.02381 | -.00228 | .00005 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0412A

(08P000) (07 MAY 73)

AMES 11-707 0412 02A

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = .000
RUDDER = -10.000 RUOFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 132/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|--------|
| .601 | -8.040 | .27500 | -.00430 | .03640 | .00490 | -.00100 | .00420 | .13230 | -.01590 | .03190 |
| .601 | -3.970 | .27700 | -.00190 | .04000 | .00940 | -.00470 | .00620 | .05660 | -.00700 | .03030 |
| .601 | .090 | .26700 | -.00120 | .04280 | .01310 | -.00350 | .00810 | -.02040 | -.00450 | .02960 |
| .601 | 4.180 | .26300 | -.00240 | .04170 | .00990 | -.00620 | .00960 | -.09620 | -.00920 | .03180 |
| .601 | 8.260 | .26800 | -.00320 | .03820 | .00490 | -.00760 | .01270 | -.18000 | -.01960 | .03310 |
| | GRADIENT | -.00147 | -.00006 | .00021 | .00006 | -.00016 | .00042 | -.01675 | -.00027 | .00016 |

RUN NO. 137/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|---------|---------|---------|--------|
| .901 | -8.140 | .29700 | -.00790 | .07010 | .03590 | -.00170 | -.00280 | .16410 | -.02640 | .03620 |
| .901 | -4.030 | .30900 | -.00630 | .07060 | .03920 | -.00250 | -.00130 | .08100 | -.02020 | .03140 |
| .901 | .090 | .30200 | -.00560 | .07150 | .04100 | -.00390 | .00490 | -.01080 | -.01840 | .03960 |
| .901 | 4.220 | .30200 | -.00640 | .07200 | .03880 | -.00360 | .01130 | -.10310 | -.02110 | .03320 |
| .901 | 8.370 | .28600 | -.00750 | .07280 | .03530 | -.00790 | .01490 | -.19600 | -.02610 | .03730 |
| | GRADIENT | -.00085 | -.00001 | .00017 | -.00005 | -.00090 | .00153 | -.02232 | -.00011 | .00022 |

(RBP009) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0412A

ANES 11-707 0412 CBA

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
RUDDER = -10.000 RUDDER = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 133/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CABO |
|------|----------|---------|---------|--------|---------|---------|--------|---------|---------|---------|
| .999 | -8.060 | .53900 | -.00730 | .01340 | -.02050 | .00360 | .00390 | .13780 | -.01350 | .03400 |
| .999 | -3.980 | .54900 | -.00480 | .01750 | -.01550 | -.00110 | .00560 | .06200 | -.00870 | .03310 |
| .999 | .090 | .55800 | -.00470 | .02110 | -.00900 | -.00470 | .00690 | -.01610 | -.00830 | .03000 |
| .999 | 4.170 | .53500 | -.00530 | .01980 | -.01180 | -.00740 | .00790 | -.09310 | -.01000 | .03160 |
| .999 | 8.240 | .53600 | -.00840 | .01780 | -.01560 | -.01080 | .01020 | -.17450 | -.01560 | .03340 |
| | GRADIENT | -.00123 | -.00006 | .00028 | .00045 | -.00077 | .00028 | -.01903 | -.00016 | -.00018 |

RUN NO. 138/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CABO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| .900 | -8.160 | .56000 | -.01010 | .07310 | .03760 | .00580 | .00000 | .15270 | -.01810 | .03750 |
| .900 | -4.040 | .57700 | -.00850 | .07670 | .04120 | .00180 | .00020 | .07530 | -.01470 | .03550 |
| .900 | .090 | .57300 | -.00850 | .07850 | .04500 | -.00300 | .00370 | -.00710 | -.01490 | .03390 |
| .900 | 4.200 | .56800 | -.00960 | .07730 | .04190 | -.00830 | .00910 | -.09330 | -.01690 | .03540 |
| .900 | 8.330 | .55600 | -.01090 | .07630 | .03970 | -.01120 | .01180 | -.18200 | -.01960 | .03730 |
| | GRADIENT | -.01109 | -.00013 | .00007 | .00009 | -.00123 | .00108 | -.02046 | -.00027 | -.00001 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-C A

PAGE 10

(RBP010) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

ALPHA = 15.000

ELEVON = .000

RUDDER = -10.000

RUDFLR = .000

PARAMETRIC DATA

RUN NO. 134/ 5 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|--------|---------|---------|---------|---------|--------|---------|---------|--------|
| .601 | -8.040 | .78000 | -.01050 | .02810 | -.01020 | .00720 | .00440 | .13740 | -.01340 | .03810 |
| .601 | -3.980 | .78700 | -.00900 | .03590 | -.00030 | -.00160 | .00620 | .06030 | -.01150 | .03630 |
| .601 | .080 | .78800 | -.00880 | .03960 | .00260 | -.00690 | .00740 | -.01620 | -.01120 | .03700 |
| .601 | 4.170 | .79200 | -.00960 | .03380 | -.00300 | -.01040 | .00770 | -.09210 | -.01210 | .03680 |
| .601 | 8.250 | .79600 | -.01230 | .03000 | -.00880 | -.01450 | .00970 | -.17490 | -.01570 | .03880 |
| | GRADIENT | .00061 | -.00007 | -.00026 | -.02033 | -.00108 | .00018 | -.01870 | -.00007 | .00006 |

RUN NO. 139/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| .902 | -8.130 | .80400 | -.01930 | .08190 | .03870 | .00480 | .00480 | .13900 | -.02400 | .04320 |
| .902 | -4.020 | .80700 | -.01780 | .08500 | .04290 | .00080 | .00400 | .06420 | -.02200 | .04210 |
| .902 | .080 | .80100 | -.01760 | .08860 | .04820 | -.00320 | .00370 | -.00630 | -.02200 | .04090 |
| .902 | 4.200 | .79500 | -.01860 | .08520 | .04440 | -.00770 | .00380 | -.08360 | -.02330 | .04060 |
| .902 | 8.330 | .79500 | -.01920 | .08420 | .04060 | -.01250 | .00810 | -.17170 | -.02410 | .04370 |
| | GRADIENT | -.00109 | -.00010 | .00002 | .00018 | -.00103 | .00022 | -.01798 | -.00016 | -.00016 |

(RBP011) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AWES 11-707 0A12 OFA

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
RUDDER = -10.000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 30.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
DREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

GRADIENT INTERVAL = -5.00/ 5.00

RUN NO. 135/ 0 RM/L = 3.98

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|--------|---------|---------|---------|
| .958 | -7.990 | 1.08600 | -.01920 | .03630 | -.00790 | .00570 | .00630 | .13980 | -.01760 | .04440 |
| .958 | -3.940 | 1.08800 | -.01530 | .04040 | -.00230 | -.00000 | .00770 | .03930 | -.01410 | .04270 |
| .958 | .090 | 1.08000 | -.01540 | .04820 | .00440 | -.00460 | .00890 | -.02080 | -.01430 | .04380 |
| .958 | 4.190 | 1.06100 | -.01600 | .04100 | -.00260 | -.00720 | .00820 | -.09870 | -.01510 | .04160 |
| .958 | 8.310 | 1.05900 | -.01890 | .03660 | -.00710 | -.01160 | .00810 | -.18030 | -.01780 | .04370 |
| | GRADIENT | -.00332 | -.00009 | .00007 | .00021 | -.00085 | .00006 | -.01939 | -.00012 | -.00014 |

GRADIENT INTERVAL : -5.00/ 5.00

RUN NO. 140/ 0 RM/L = 4.90

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| .901 | -8.060 | 1.02800 | -.01740 | .08710 | .03210 | .00870 | .01550 | .10590 | -.01690 | .05500 |
| .901 | -3.980 | 1.04300 | -.01500 | .09120 | .03650 | .00430 | .01380 | .03580 | -.01430 | .05470 |
| .901 | .090 | 1.04900 | -.01690 | .09480 | .04550 | -.00190 | .00470 | -.01310 | -.01610 | .05130 |
| .901 | 4.230 | 1.03500 | -.01740 | .09300 | .04260 | -.00840 | -.00380 | -.07020 | -.01680 | .05020 |
| .901 | 8.360 | 1.02600 | -.01790 | .09020 | .03890 | -.01900 | -.00240 | -.14090 | -.01710 | .05130 |
| | GRADIENT | -.00098 | -.00029 | .00022 | .00074 | -.00155 | -.00214 | -.01291 | -.00030 | -.00031 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

(RFP012) (07 MAY 73)

PAGE 12

AMES 11-757 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

XMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

ALPHA = .000 ELEVON = .000
 RUDDER = -20.000 RUDDFLR = .000

PARAMETRIC DATA

RUN NO. 141/ 0 RM/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|--------|---------|---------|--------|
| .599 | -7.970 | .03400 | -.00160 | .05460 | .02030 | -.00840 | .01240 | .11010 | -.04660 | .03400 |
| .599 | -3.930 | .02500 | .00240 | .06000 | .02540 | -.00980 | .01470 | .02990 | .09890 | .03460 |
| .599 | .100 | .01400 | .00310 | .06280 | .02960 | -.00880 | .01520 | -.04240 | .23210 | .03310 |
| .599 | 4.210 | .01900 | .00160 | .06080 | .02470 | -.00190 | .01790 | -.12150 | .10340 | .03610 |
| .599 | 8.330 | .02500 | -.00240 | .05410 | .01620 | -.00920 | .02060 | -.20390 | -.09370 | .03790 |
| | GRADIENT | -.00122 | -.00010 | .00010 | -.00009 | .00011 | .00039 | -.01860 | .00106 | .00719 |

RUN NO. 146/ 0 RM/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|---------|--------|
| .901 | -8.090 | .02900 | -.00320 | .07630 | .03890 | -.00780 | -.00120 | .16220 | -.11300 | .03780 |
| .901 | -4.000 | .03900 | -.00120 | .08010 | .04220 | -.00780 | .00270 | .07280 | -.02580 | .03790 |
| .901 | .100 | .03600 | .00000 | .08200 | .04600 | -.00620 | .01000 | -.02370 | .00000 | .03600 |
| .901 | 4.280 | .03100 | -.00120 | .08160 | .04390 | -.00580 | .01910 | -.13010 | -.03750 | .03790 |
| .901 | 8.430 | .01600 | -.00250 | .08280 | .03860 | -.00380 | .02250 | -.21920 | -.15280 | .04420 |
| | GRADIENT | -.00097 | -.00000 | .00018 | .00019 | .00024 | .00198 | -.02451 | -.00096 | .00000 |

REFERENCE DATA

| | | | |
|---------|---------------|--------|-------------|
| 3REF = | 2.4210 SQ.FT. | 396P = | 32.3000 IN. |
| 4REF = | 37.8490 IN. | 796P = | .0000 IN. |
| 896P = | 39.8490 IN. | 796P = | .0000 IN. |
| SCALE = | .0300 SCALE | | |

| | | | |
|----------|---------|----------|------|
| ALPHA = | 5.000 | CLEVEN = | .000 |
| BUDGER = | -20.000 | RUDFLR = | .000 |

PARAMETRIC DATA

| BETA | GN | CLM | CA | CAF | CBL | CYN | CTN |
|----------|---------|---------|--------|---------|---------|--------|--------|
| -8.030 | .27900 | -.00290 | .04330 | .00830 | -.00490 | .01150 | .1150 |
| -3.970 | .27700 | -.00040 | .04830 | .01480 | -.00820 | .01360 | .01360 |
| .100 | .27530 | .00030 | .05090 | .01780 | -.00870 | .01530 | .01530 |
| 4.180 | .26700 | -.00130 | .04980 | .01430 | -.01000 | .01720 | .11720 |
| 8.270 | .27100 | -.00410 | .04450 | .00750 | -.01080 | .01960 | .21960 |
| GRADIENT | -.00123 | -.00007 | .00006 | -.00006 | -.00022 | .00044 | .00044 |

| PARAM | BETA | CN | CLM | CA | CAF | CEL | CYN | CY |
|----------|--------|---------|---------|--------|--------|---------|---------|-----|
| .902 | -8.140 | .29800 | -.00680 | .07490 | .03930 | -.00230 | -.00090 | .1 |
| .902 | -4.029 | .30800 | -.00440 | .07630 | .04060 | -.00490 | .00270 | .0 |
| .902 | .100 | .30700 | -.00410 | .08130 | .04720 | -.00690 | .00980 | -.0 |
| .902 | 4.250 | .29800 | -.00400 | .07960 | .04290 | -.01010 | .01800 | -.1 |
| .902 | 8.380 | .28400 | -.00570 | .08100 | .03930 | -.01060 | .02110 | -.2 |
| GRADIENT | | -.00121 | .00005 | .00040 | .00028 | -.00068 | .00185 | -.0 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0412A

AVES 11-707 0412 02A

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
RUDDER = -20.000 RUFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8493 IN. YMRP = .0000 IN.
BREF = 39.8493 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 143/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | XCF/L | CASO |
|------|----------|---------|---------|--------|---------|---------|--------|---------|---------|---------|
| .999 | -8.060 | .55700 | -.00630 | .01890 | -.01820 | .00020 | .01110 | .11790 | -.01135 | -.02770 |
| .999 | -3.980 | .56100 | -.00330 | .02900 | -.01110 | -.00470 | .01300 | .03920 | -.00380 | -.03510 |
| .999 | .090 | .55900 | -.00263 | .02900 | -.00490 | -.00330 | .01420 | -.03730 | -.01450 | -.03350 |
| .999 | 4.170 | .55200 | -.00430 | .02690 | -.00790 | -.01120 | .01550 | -.11990 | -.00780 | -.03440 |
| .999 | 8.250 | .54800 | -.00760 | .02330 | -.01370 | -.01420 | .01680 | -.19350 | -.01320 | -.01580 |
| .999 | GRADIENT | -.00110 | -.00012 | .00018 | .00039 | -.00080 | .00031 | -.01699 | -.00025 | -.00021 |

RUN NO. 148/ 0 RV/L = 4.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | XCF/L | CASO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| .906 | -8.150 | .56400 | -.00910 | .07910 | .03920 | .00490 | .00180 | .14700 | -.01610 | -.04000 |
| .906 | -4.040 | .57200 | -.00690 | .08230 | .04360 | .00000 | .00370 | .06490 | -.01200 | -.03960 |
| .906 | .090 | .57900 | -.00720 | .08690 | .04960 | -.00560 | .00900 | -.02060 | -.01260 | -.03750 |
| .906 | 4.210 | .56700 | -.00810 | .08580 | .04800 | -.01180 | .01590 | -.11190 | -.01430 | -.03780 |
| .906 | 8.390 | .55300 | -.00950 | .08460 | .04280 | -.01420 | .01690 | -.20090 | -.01730 | -.04180 |
| .906 | GRADIENT | -.00061 | -.00015 | .00042 | .00093 | -.00143 | .00148 | -.02143 | -.00028 | -.00010 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(R0P015) (C7 MAY 75)

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
RUCER = -20.000 RUCFLR = .000

REFERENCE DATA

SREF = 2.4210 58.47.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0000 SCALE

RUN NO. 144/ 0 RNL = 5.99 GRADIENT INTERVAL = -5.02/ 5.00

| MACN | BETA | CN | CLM | CA | CAF | CEL | CYN | CV | KCP/L | CABO |
|------|----------|---------|---------|---------|---------|---------|--------|---------|---------|---------|
| .600 | -8.040 | .76200 | -.00960 | .03670 | -.00530 | .00350 | .01140 | .11570 | -.01230 | .04230 |
| .600 | -3.970 | .79000 | -.00740 | .04300 | .00320 | -.00310 | .01360 | .03820 | -.00940 | .04770 |
| .600 | .100 | .76800 | -.00730 | .04930 | .00810 | -.01000 | .01410 | -.03750 | -.00930 | .04210 |
| .600 | 4.160 | .77200 | -.00770 | .04060 | .00180 | -.01430 | .01530 | -.11720 | -.01000 | .03880 |
| .600 | 8.260 | .77400 | -.01090 | .03630 | -.00920 | -.01820 | .01620 | -.19750 | -.01410 | .04140 |
| | GRADIENT | -.00221 | -.00304 | -.00339 | -.00317 | -.00113 | .00221 | -.01907 | -.00007 | -.00023 |

RUN NO. 149/ 0 RNL = 4.48 GRADIENT INTERVAL = -5.02/ 5.00

| MACN | BETA | CN | CLM | CA | CAF | CEL | CYN | CV | KCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| .901 | -8.120 | .79400 | -.01730 | .08480 | .03710 | .00400 | .00700 | .13000 | -.02180 | .04770 |
| .901 | -4.010 | .81200 | -.01660 | .09160 | .04540 | -.00090 | .00790 | .03110 | -.02540 | .04820 |
| .901 | .090 | .79800 | -.01600 | .09620 | .00950 | -.00350 | .00900 | -.02250 | -.02000 | .04570 |
| .901 | 4.210 | .79000 | -.01630 | .09250 | .00090 | -.01120 | .01270 | -.10310 | -.02370 | .04170 |
| .901 | 8.340 | .79000 | -.01640 | .08950 | .04190 | -.01530 | .01480 | -.19000 | -.02100 | .04760 |
| | GRADIENT | -.00268 | .00004 | .00012 | .00067 | -.00125 | .00058 | -.01876 | -.00004 | -.00035 |

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DATE 13 SEP 73
 (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

ANES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

ALPHA = 20.000 ELEVON = .000
 RUDDER = -20.000 RUDDER = .000

PARAMETRIC DATA

GRADIENT INTERVAL = -5.00/ 5.00

| WACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|---------|---------|--------|---------|---------|---------|
| .604 | -7.990 | 1.08300 | -.01790 | .04220 | -.00510 | .00210 | .01350 | .11620 | -.01650 | .04750 |
| .604 | -3.950 | 1.08900 | -.01380 | .04820 | .00130 | -.00410 | .01570 | .03570 | -.01270 | .04850 |
| .604 | .100 | 1.08300 | -.01360 | .03610 | .00760 | -.00730 | .01590 | -.04170 | -.01280 | .04850 |
| .604 | 4.200 | 1.07700 | -.01470 | .04880 | .00290 | -.01090 | .11620 | -.12400 | -.01370 | .04590 |
| .604 | 8.320 | 1.05400 | -.01730 | .04250 | -.00380 | -.01490 | .110 | -.20000 | -.01650 | .04650 |
| | GRADIENT | -.00147 | -.00011 | .00007 | .00019 | -.00083 | .7024 | -.01580 | -.00012 | -.00012 |

GRADIENT INTERVAL = 5.00

| WACH | BETA | CN | CLM | CA | CAF | CBL | C | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| .899 | -8.060 | 1.02500 | -.01570 | .09120 | .03510 | .00630 | .0 | .03670 | -.01530 | .05610 |
| .899 | -3.980 | 1.03700 | -.01290 | .09590 | .04020 | .00250 | .0 | .02260 | -.01250 | .05570 |
| .899 | .090 | 1.05100 | -.01540 | .10440 | .04990 | -.00390 | .01090 | -.00080 | -.01480 | .05450 |
| .899 | 4.240 | 1.03500 | -.01510 | .10040 | .04770 | -.01060 | .00190 | -.00630 | -.01450 | .05270 |
| .899 | 8.370 | 1.01500 | -.01520 | .09590 | .04230 | -.01730 | .00380 | -.01990 | -.01500 | .05350 |
| | GRADIENT | -.00026 | -.00027 | .00014 | .00091 | -.00159 | -.00197 | -.0112 | -.00024 | -.00037 |

PARAMETRIC DATA

| | | | |
|----------|------|----------|--------|
| ALPHA = | .000 | ELEVON = | 10.000 |
| RUDDER = | .000 | RUDFLR = | .000 |

REFERENCE DATA

| | | | | | |
|---------|---------|--------|-------|---------|-----|
| SRF = | 2.4210 | 59.FT. | XRP = | 32.3000 | IN. |
| URF = | 39.8450 | IN. | YRP = | .0000 | IN. |
| BRF = | 39.8490 | IN. | ZRP = | .0000 | IN. |
| SCALE = | .0300 | SCALE | | | |

| | | |
|------|------|---------------------------------|
| 1.00 | 1.00 | GRADIENT INTERVAL = -5.00/ 5.00 |
|------|------|---------------------------------|

[illegible]

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

PARAMETRIC DATA

| | | | |
|----------|-------|----------|--------|
| ALPHA = | 5.000 | ELEVON = | 10.000 |
| BUDGER = | .000 | RUCFLR = | .000 |

REFERENCE DATA

| | | | |
|---------|---------------|---------|-------------|
| SRFP = | 2.4210 SQ.FT. | 10RFP = | 32.3000 IN. |
| LRFP = | 39.8490 IN. | 10RFP = | .3000 IN. |
| DRFP = | 39.8490 IN. | 20RFP = | .3000 IN. |
| SCALE = | .0300 SCALE | | |

[illegible][illegible]

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

STABILATED SOURCE FORCE DATA-QA12A

AMES 11-707 0A12 OEA

PARAMETRIC DATA

| | | | |
|----------|--------|-----------|--------|
| ALPHA = | 10.000 | ELEVON = | 10.000 |
| RUDDER = | .000 | RUDDFLR = | .000 |

REFERENCE DATA

SREF = 2.4210 59.FT. 106P = 32.3000 IN.
 LREF = 39.6490 IN. 116P = .0700 IN.
 BREF = 39.6490 IN. 216P = .0000 IN.
 SCALE = .0300 SCALE

PIN NO. 113/ 0 RNL = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|---------|--------|---------|--------|---------|---------|---------|---------|---------|--------|
| .999 | -10.110 | .76400 | -.04600 | .03290 | -.00720 | .00520 | -.00720 | -.21070 | -.06280 | .04020 |
| .999 | .080 | .78200 | -.04560 | .03780 | .00400 | -.00310 | -.00070 | .00790 | -.05840 | .03340 |
| .999 | 10.270 | .76300 | -.04690 | .03240 | -.00790 | -.00890 | .00480 | -.20250 | .00420 | .04020 |
| GRACIENT | .00000 | .00000 | .00000 | .00000 | .03500 | .00000 | .00000 | .00000 | .00000 | .00000 |

| | | | | |
|------------|--------|-------|------|---------------------------------|
| STATISTICS | 167.10 | 99.11 | 4.48 | GRADIENT INTERVAL = -5.00/ 5.00 |
|------------|--------|-------|------|---------------------------------|

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|---------|--------|---------|--------|--------|---------|---------|---------|---------|--------|
| .897 | -10.210 | .74600 | -.05400 | .09710 | .05040 | .01000 | -.00310 | .19500 | -.07240 | .04670 |
| .897 | .090 | .76900 | -.05320 | .09960 | .05840 | .00060 | -.00250 | .00270 | -.06910 | .04120 |
| .897 | 10.390 | .75400 | -.05520 | .09840 | .05340 | -.00860 | .00240 | -.20000 | -.07320 | .04500 |
| .897 | | | | .00000 | .03000 | .00000 | .00200 | .00000 | .00000 | .00000 |

(88P120) (07 MAY 73)

STABILIZED SOURCE FORCE DATA-0412A

AMES 11-707 OA12 OPA

PARAMETRIC DATA

| | | | |
|----------|--------|-----------|--------|
| ALPHA = | 15.000 | ELEVON = | 10.000 |
| RUDDER = | .000 | RUDDFLR = | .000 |

REFERENCE DATA

| | | | | | |
|---------|---------|--------|--------|---------|-----|
| SREF = | 2.4210 | 59.FT. | X66P = | 32.3000 | IN. |
| LREF = | 39.8490 | IN. | Y66P = | .0000 | IN. |
| BREF = | 39.8490 | IN. | Z66P = | .0000 | IN. |
| SCALE = | .0300 | SCALE | | | |

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 OEA

PARAMETRIC DATA

| | | | |
|----------|--------|----------|--------|
| ALPHA = | 20.000 | ELEVON = | 10.000 |
| RUDDER = | .000 | RUDFLR = | .000 |

REFERENCE DATA

| | | | |
|---------|---------------|--------|-------------|
| 38EP = | 2.4210 90.FT. | 30RP = | 32.3000 IN. |
| 18EP = | 39.0490 IN. | 18RP = | .0002 IN. |
| 28EP = | 39.0490 IN. | 28RP = | .0000 IN. |
| SCALE = | .0300 SCALE | | |

455/ 0 RM/ = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

1994: 5 $\text{BMD} = 4.48$ $\text{GRADIENT INTERVAL} = -5.00/ 5.00$

[illegible]

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(RBP022) (07 MAY 73)

AVES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = .000 ELEVON = -10.000
RUDDER = .000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 31.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 161/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|--------|---------|---------|---------|---------|---------|--------|
| .597 | -7.970 | -1.6100 | .03070 | .04530 | .01630 | -.00060 | -.00170 | .14460 | -.19120 | .02920 |
| .597 | -3.940 | -1.6100 | .03390 | .04990 | .02240 | -.00130 | -.00130 | .07400 | -.21010 | .02750 |
| .597 | .080 | -1.7100 | .03510 | .05200 | .02510 | -.00110 | -.00010 | .00200 | -.20590 | .02690 |
| .597 | 4.200 | -1.7400 | .03410 | .05000 | .02160 | -.00080 | .00150 | -.07260 | -.19600 | .02840 |
| .597 | 8.300 | -1.6800 | .03070 | .04520 | .01450 | .00000 | .00210 | -.14670 | -.18340 | .03070 |
| | GRADIENT | -.00159 | .00002 | .00001 | -.00010 | .00006 | .00034 | -.01801 | .00173 | .00011 |

RUN NO. 166/ 0 RV/L = 4.53 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|---------|---------|---------|---------|---------|--------|
| .904 | -8.090 | -1.2600 | .03070 | .07980 | .04510 | -.00360 | -.00710 | .17620 | -.24280 | .03470 |
| .904 | -4.000 | -1.2600 | .03530 | .07990 | .04760 | -.00280 | -.01380 | .08790 | -.27960 | .03240 |
| .904 | .080 | -1.4300 | .03840 | .08090 | .04990 | -.00210 | .00060 | .00040 | -.26860 | .03090 |
| .904 | 4.250 | -1.4200 | .03620 | .07870 | .04490 | .00000 | .00320 | -.08440 | -.25620 | .03450 |
| .904 | 8.410 | -1.3700 | .03130 | .07660 | .04200 | .00230 | .00650 | -.17480 | -.22920 | .03460 |
| | GRADIENT | -.00193 | .00011 | -.00015 | -.00033 | .00034 | .00085 | -.02088 | .00286 | .00018 |

(RBP023) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AWES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 5.000 ELEV⁰ = -10.000
RUDDER = .000 J_R = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 162/ 0 RNVL = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|--------|--------|
| .598 | -8.030 | .06600 | .03140 | .03600 | .00690 | .00290 | -.00180 | .14330 | .47380 | .03100 |
| .598 | -3.970 | .06300 | .03450 | .04040 | .01260 | -.00020 | -.00100 | .07320 | .54540 | .02770 |
| .598 | .080 | .05100 | .03550 | .04250 | .01560 | -.00090 | -.00010 | .00270 | .69170 | .02690 |
| .598 | 4.170 | .05200 | .03480 | .04120 | .01300 | -.00190 | .00120 | -.07160 | .67220 | .02820 |
| .598 | 8.250 | .05300 | .03180 | .03780 | .00870 | -.00290 | .00310 | -.15120 | .59590 | .02520 |
| | GRADIENT | -.00135 | .00004 | .00010 | .00005 | -.00021 | .00027 | -.01779 | .01554 | .00356 |

RUN NO. 167/ 0 RNVL = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| .901 | -8.140 | .17900 | .01860 | .07530 | .03940 | .00000 | -.00060 | .17150 | .10420 | .03600 |
| .901 | -4.030 | .18600 | .02150 | .07540 | .04390 | -.00160 | -.00400 | .08670 | .11540 | .03150 |
| .901 | .090 | .18300 | .02310 | .07700 | .04650 | -.00210 | .00060 | .00040 | .12640 | .03060 |
| .901 | 4.220 | .18500 | .02090 | .07470 | .04300 | -.00190 | .00400 | -.03410 | .11290 | .03180 |
| .901 | 8.350 | .17100 | .01890 | .07450 | .04040 | -.00170 | .00570 | -.17060 | .11020 | .03410 |
| | GRADIENT | -.00012 | -.00007 | -.00009 | -.00011 | -.00004 | .00097 | -.02074 | -.00000 | .00004 |

(RBP024) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 75

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -10.000
RUDDER = .000 RUFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 163/ 0 RVNL = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|---------|--------|---------|---------|---------|---------|--------|---------|
| .999 | -8.080 | .33600 | .02930 | .01370 | -.01890 | .00700 | -.00150 | .14900 | .08710 | .03270 |
| .999 | -3.990 | .33200 | .03260 | .01630 | -.01320 | .00290 | -.00110 | .07800 | .09820 | .02950 |
| .999 | .080 | .32400 | .03400 | .01890 | -.00870 | -.00040 | -.00080 | .00640 | .10500 | .02770 |
| .999 | 4.190 | .32600 | .03250 | .01950 | -.00950 | -.00330 | -.00030 | -.06820 | .09940 | .02600 |
| .999 | 8.233 | .32400 | .02870 | .01710 | -.01310 | -.00660 | .00130 | -.14660 | .09850 | .03020 |
| | GRADIENT | -.00074 | -.00001 | .00039 | .00045 | -.00076 | .00010 | -.01796 | .00015 | -.00056 |

RUN NO. 168/ 0 RVNL = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|---------|--------|
| .900 | -8.150 | .45700 | .01460 | .08100 | .04290 | .00970 | -.00410 | .16160 | .03190 | .03820 |
| .900 | -4.030 | .46200 | .01820 | .08200 | .04840 | .00510 | -.00330 | .08680 | .03930 | .03370 |
| .900 | .080 | .45700 | .01950 | .08440 | .05180 | -.00160 | .00000 | .00670 | .04270 | .03250 |
| .900 | 4.190 | .45500 | .01720 | .08250 | .04880 | -.00660 | .00260 | -.07400 | .03790 | .03380 |
| .900 | 8.330 | .44800 | .01500 | .08080 | .04640 | -.01000 | .00360 | -.15990 | .03370 | .03440 |
| | GRADIENT | -.00085 | -.00012 | .00006 | .00005 | -.00142 | .00072 | -.01956 | -.00017 | .00001 |

(R8P025) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AKES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = -10.000
RUDDER = .000 RUCFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 164/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| .598 | -8.040 | .59800 | .02370 | .02200 | -.01400 | .03890 | -.00170 | .15380 | .03960 | .03800 |
| .598 | -3.990 | .60300 | .02540 | .02770 | -.00310 | .00260 | -.00130 | .00340 | .04220 | .03260 |
| .598 | .080 | .59100 | .02680 | .03030 | -.00270 | -.00220 | -.00090 | .01030 | .04520 | .03300 |
| .598 | 4.160 | .58900 | .02540 | .02640 | -.00660 | -.00640 | -.00090 | -.06630 | .04390 | .03300 |
| .598 | 8.250 | .58700 | .02260 | .02190 | -.01350 | -.01090 | .00060 | -.14820 | .03850 | .03510 |
| GRADIENT | | -.00172 | -.00300 | -.00016 | -.00018 | -.00110 | .00006 | -.01837 | .02010 | .00002 |

RUN NO. 169/ 0 RV/L = 4.46 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|---------|---------|--------|---------|---------|---------|---------|---------|--------|
| .899 | -8.130 | .66400 | .01530 | .08800 | .04860 | .00810 | .00020 | .14990 | .02300 | .03940 |
| .899 | -4.020 | .66600 | .01740 | .08810 | .05230 | .00380 | -.00030 | .07190 | .02620 | .03580 |
| .899 | .080 | .66900 | .01740 | .09210 | .05620 | -.00030 | -.00060 | .07670 | .02610 | .03590 |
| .899 | 4.190 | .65500 | .01700 | .08820 | .05230 | -.00500 | -.00010 | -.06460 | .02390 | .03590 |
| .899 | 8.330 | .65400 | .01550 | .08670 | .05070 | -.00980 | .00080 | -.14920 | .02370 | .03590 |
| GRADIENT | | -.00134 | -.00005 | .00001 | -.00000 | -.00107 | .00002 | -.01663 | -.00004 | .00001 |

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -19.000
 RUDDER = .000 RUCFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0000 SCALE

RUN NO. 165/ 0 RN/L = 3.9% GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|--------|---------|---------|--------|---------|---------|---------|---------|---------|---------|
| .999 | -7.980 | .89700 | .01480 | .02840 | -.01380 | .01010 | .06110 | .15130 | .01680 | .04220 |
| .999 | -3.960 | .89600 | .01830 | .03090 | -.00790 | .00420 | .00060 | .07990 | .02040 | .03890 |
| .999 | .070 | .88800 | .01850 | .03750 | -.00280 | -.00020 | .00030 | .00660 | .02090 | .04030 |
| .999 | 4.190 | .86000 | .01860 | .03170 | -.00680 | -.00120 | -.00120 | -.06840 | .02040 | .03830 |
| .999 | 8.300 | .87600 | .01590 | .02660 | -.01220 | -.00910 | -.00120 | -.14720 | .01820 | .03830 |
| GRADIENT | | -.00196 | -.00004 | .00009 | .00016 | -.00096 | -.00022 | -.01820 | -.00000 | -.00000 |

RUN NO. 170/ 0 RN/L = 4.48% GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| .904 | -8.070 | .87300 | .01930 | .08580 | .03910 | .01080 | .06910 | .12680 | .02270 | .05970 |
| .904 | -3.990 | .88500 | .02340 | .08390 | .04390 | .00960 | .00840 | .05340 | .02650 | .05510 |
| .904 | .080 | .89100 | .02190 | .09700 | .04860 | -.00080 | .00080 | .00100 | .02480 | .04830 |
| .904 | 4.230 | .87800 | .02160 | .09350 | .04760 | -.00700 | -.00820 | -.05730 | .02480 | .04530 |
| .904 | 8.560 | .87200 | .01840 | .09040 | .04510 | -.01230 | -.00820 | -.12450 | .02110 | .04530 |
| GRADIENT | | -.00086 | -.00022 | -.00005 | .00045 | -.00153 | -.00202 | -.01347 | -.00000 | -.00000 |

DATE 13 SEP 73 (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AXES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0390 SCALE

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = -20.000
 RUDDER = .000 RUDDLE = .000

RUN NO. 17/ 0 RN/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|---------|
| .800 | -4.910 | -.46500 | .05350 | .06570 | .03980 | -.00520 | -.00150 | .08990 | -.11490 | .02690 |
| .800 | .080 | -.48700 | .05650 | .06830 | .04220 | -.00100 | .00000 | .00210 | -.11610 | .02520 |
| .800 | 5.260 | -.48700 | .05450 | .06480 | .03800 | .00390 | .00220 | -.09760 | -.11190 | .02680 |
| | GRADIENT | -.00441 | .00060 | .00052 | .00068 | .00084 | .00030 | -.01760 | -.00024 | -.00018 |

RUN NO. 182/ 0 RN/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|---------|
| .899 | -4.980 | -.50200 | .06930 | .10330 | .07080 | -.00230 | -.00260 | .10560 | -.13820 | .03250 |
| .899 | .080 | -.51700 | .07300 | .10830 | .07700 | -.00120 | .00100 | .00100 | -.14130 | .03130 |
| .899 | 5.330 | -.51400 | .06990 | .10440 | .06880 | .00200 | .00320 | -.10220 | -.13590 | .03560 |
| | GRADIENT | -.00296 | .00075 | .00799 | .00123 | .00000 | .00071 | -.02067 | -.00061 | -.00024 |

DATE 13 SEP 75

TABULATED SOURCE FORCE DATA-0A12A

PAGE 28

(08P028) (07 MAY 75)

AMES 11-707 7A12 08A

REFERENCE DATA

XREF = 2.4210 58.FT.
 YREF = 39.8490 IN.
 ZREF = 39.8490 IN.
 SCALE = .0300 SCALE

ALPHA = .000 ELEVON = -20.000
 RUDDER = .000 RUDDER = .000

PARAMETRIC DATA

RUN NO. 172/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|--------|---------|--------|---------|---------|---------|---------|---------|
| .998 | -7.870 | -27400 | .04960 | .07160 | .03990 | -.00330 | -.00110 | .13790 | -.18110 | .03170 |
| .998 | -3.940 | -28000 | .05270 | .07300 | .04740 | -.00280 | -.00090 | .07000 | -.18860 | .02770 |
| .998 | .090 | -29000 | .05440 | .07740 | .04990 | -.00080 | .00000 | .00230 | -.18730 | .02750 |
| .998 | 4.190 | -29100 | .05310 | .07470 | .04840 | .00070 | .00130 | -.08950 | -.18260 | .02630 |
| .998 | 8.290 | -28400 | .04990 | .07020 | .04380 | .00390 | .00190 | -.13910 | -.17530 | .02530 |
| | GRADIENT | -.00135 | .00005 | -.00004 | .00012 | .00041 | .00027 | -.01716 | .00074 | -.00017 |

RUN NO. 181/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|--------|--------|---------|---------|---------|---------|---------|--------|
| .900 | -8.080 | -26000 | .05590 | .10150 | .06720 | .00000 | -.00360 | .16160 | -.21520 | .03430 |
| .900 | -4.000 | -26700 | .06140 | .10590 | .07490 | -.00080 | -.00160 | .08130 | -.23010 | .03140 |
| .900 | .080 | -27700 | .06370 | .10870 | .07760 | -.00130 | .00180 | .00260 | -.23900 | .03110 |
| .900 | 4.240 | -27300 | .06180 | .10610 | .07420 | -.00060 | .00190 | -.07380 | -.22660 | .03190 |
| .900 | 8.400 | -26400 | .05600 | .10040 | .06710 | -.00040 | .00440 | -.16080 | -.21170 | .03330 |
| | GRADIENT | -.00072 | .00005 | .00002 | -.00004 | .00002 | .00042 | -.01882 | .00043 | .00005 |

0000029 (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 75

PARAMETRIC DATA

ALPHA = 5.000 ELEVOM = -20.000
RUDDER = .000 RUJFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 175/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | XCF/L | CASO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|----------|---------|
| .600 | -8.030 | -.05000 | .04970 | .06370 | .03120 | -.00010 | -.00100 | .13670 | -.99240 | .03250 |
| .600 | -3.900 | -.04500 | .03250 | .06670 | .03790 | -.00180 | -.00040 | .06940 | -1.15500 | .02880 |
| .600 | .080 | -.06300 | .05410 | .06890 | .04220 | .00020 | .00010 | .00190 | -.85590 | .02870 |
| .600 | 4.160 | -.06200 | .05270 | .06730 | .04110 | .00080 | .00120 | -.06780 | -.85590 | .02880 |
| .600 | 8.250 | -.05600 | .04930 | .06370 | .03680 | -.00010 | .00270 | -.14530 | -.87790 | .02590 |
| .600 | GRADIENT | -.00209 | .00002 | .00010 | .00039 | .00032 | .00020 | -.01686 | .03682 | -.00035 |

RUN NO. 180/ 0 RV/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | XCF/L | CASO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|--------|
| .896 | -8.130 | .04800 | .04340 | .09470 | .05760 | .00000 | -.00270 | .15690 | .89540 | .03710 |
| .896 | -4.020 | .05000 | .04770 | .09330 | .06430 | -.00030 | -.00140 | .07810 | .84880 | .03100 |
| .896 | .080 | .03700 | .04990 | .09640 | .06610 | -.00130 | .00090 | .00190 | 1.36200 | .03250 |
| .896 | 4.210 | .03700 | .04870 | .09760 | .06640 | -.00240 | .00200 | -.07310 | 1.33300 | .03120 |
| .895 | 8.340 | .03800 | .04370 | .09300 | .06020 | -.00190 | .00400 | -.15990 | 1.16800 | .03290 |
| .895 | GRADIENT | -.00158 | .00012 | .00028 | .00025 | -.00026 | .00341 | -.01837 | .04653 | .00002 |

(REPROD) (07 MAY 75)

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

ANES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -20.000
RUDDER = .000 RUDDER = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 174/ 0 RV/L = 3.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CB | CYN | CY | XCP/L | CASO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|--------|---------|
| .598 | -8.030 | .19800 | .04960 | .09930 | .09930 | .00770 | -.00050 | .14190 | .29579 | .03400 |
| .598 | -3.980 | .20100 | .05290 | .04090 | .01230 | .00360 | .00000 | .07270 | .26340 | .02380 |
| .598 | .090 | .19400 | .05330 | .04410 | .01670 | .00330 | .00010 | .00450 | .27430 | .02740 |
| .598 | 4.150 | .19400 | .05220 | .04330 | .01560 | -.00290 | .00040 | -.56870 | .26380 | .02770 |
| .598 | 8.730 | .19600 | .04840 | .04160 | .01350 | -.00500 | .00120 | -.14350 | .24770 | .02810 |
| .598 | GRADIENT | -.00080 | -.00009 | .00730 | .00341 | -.00190 | .00005 | -.01729 | .00079 | -.00011 |

RUN NO. 179/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CB | CYN | CY | XCP/L | CASO |
|------|----------|---------|---------|--------|--------|---------|---------|---------|--------|---------|
| .903 | -8.160 | .41200 | .02430 | .09180 | .05540 | .00890 | -.00230 | .16580 | .03900 | .03620 |
| .903 | -4.040 | .42500 | .02710 | .09450 | .06270 | .00370 | -.00200 | .08250 | .06370 | .03180 |
| .903 | .080 | .41800 | .02780 | .09770 | .06630 | -.00090 | .00050 | .00650 | .06650 | .03140 |
| .903 | 4.190 | .41200 | .02680 | .09490 | .06310 | -.00490 | .00170 | -.06950 | .06900 | .03180 |
| .903 | 8.320 | .40100 | .02410 | .09240 | .05870 | -.00910 | .00220 | -.15210 | .06000 | .03340 |
| .903 | GRADIENT | -.00158 | -.00004 | .00075 | .00005 | -.00104 | .00245 | -.01849 | .00016 | -.00000 |

(RBP031) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = -20.000
RUDDER = .000 RUDDFLR = .000

REFERENCE DATA

REF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.6490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 175/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|---------|--------|---------|---------|---------|---------|---------|--------|---------|
| .800 | -8.040 | .46620 | .04680 | .03680 | .00320 | .00900 | -.00060 | .14510 | .10050 | .03560 |
| .850 | -3.980 | .46100 | .05160 | .04390 | .01310 | .00400 | -.00030 | .07550 | .11200 | .03090 |
| .900 | .080 | .44800 | .05270 | .04740 | .01720 | -.00080 | .00010 | .00540 | .11750 | .03020 |
| .950 | 4.170 | .43800 | .05250 | .04040 | .01140 | -.00420 | -.00020 | -.06960 | .11980 | .02900 |
| .000 | 8.240 | .44900 | .04800 | .03590 | .00630 | -.00820 | .00090 | -.14640 | .10590 | .02960 |
| GRADIENT | | -.00282 | .00011 | -.00043 | -.00021 | -.00101 | .00001 | -.01780 | .00056 | -.00023 |

RUN NO. 178/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| .898 | -8.130 | .63100 | .02240 | .10030 | .06350 | .01110 | .00110 | .14910 | .03540 | .03680 |
| .898 | -4.020 | .62200 | .02690 | .10160 | .07070 | .00570 | .00020 | .07240 | .04320 | .03090 |
| .898 | .080 | .61500 | .02730 | .10500 | .07190 | -.00050 | -.00060 | .00490 | .04430 | .03310 |
| .898 | 4.200 | .62000 | .02540 | .10160 | .06790 | -.00780 | -.00070 | -.06640 | .04090 | .03370 |
| .898 | 8.330 | .62200 | .02080 | .09810 | .06160 | -.01220 | -.00040 | -.14790 | .03350 | .03650 |
| GRADIENT | | -.00024 | -.00018 | -.00000 | -.00034 | -.00164 | -.00011 | -.01689 | -.00028 | .00034 |

ANES 11-707 0A12 CBA

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

ALPHA = 20.000
 RUDDER = .000
 ELEVON = -20.000
 RUFLR = .000

PARAMETRIC DATA

RUN NO. 176/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CABO |
|----------|--------|---------|---------|---------|--------|---------|---------|---------|--------|---------|
| .600 | -7.980 | .72700 | .04410 | .04720 | .00740 | .01100 | .00180 | .14710 | .06060 | .03980 |
| .605 | -3.950 | .73800 | .04800 | .04990 | .01400 | .00450 | .00100 | .07760 | .06500 | .03590 |
| .600 | .070 | .73300 | .04780 | .05590 | .01940 | .00020 | .00040 | .00680 | .06520 | .03820 |
| .600 | 4.190 | .72000 | .04750 | .04950 | .01440 | -.00330 | -.00110 | -.06610 | .06580 | .03310 |
| .600 | 8.290 | .70300 | .04470 | .04250 | .00810 | -.00850 | -.00160 | -.14250 | .06350 | .03450 |
| GRADIENT | | -.00222 | -.00009 | -.00005 | .00004 | -.00096 | -.00026 | -.01765 | .00010 | -.00010 |

RUN NO. 177/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CABO |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| .902 | -8.070 | .83900 | .02840 | .10580 | .05780 | .01080 | .00890 | .13160 | .03390 | .04800 |
| .902 | -4.090 | .83100 | .03590 | .11200 | .06620 | .00590 | .00820 | .05850 | .04280 | .04570 |
| .902 | .070 | .82400 | .03440 | .11510 | .07220 | -.00050 | .00020 | .00540 | .04180 | .04290 |
| .902 | 4.220 | .82500 | .03390 | .11210 | .06900 | -.00680 | -.00810 | -.05410 | .04060 | .04320 |
| .902 | 8.360 | .83900 | .02570 | .10270 | .06200 | -.01180 | -.00770 | -.12530 | .03060 | .04070 |
| GRADIENT | | -.00075 | -.00024 | .00001 | .00034 | -.00154 | -.00198 | -.01370 | -.00027 | -.00030 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0412A

(RBP033) (07 MAY 73)

AWES 11-707 0412 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = .000 RUDDFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 183/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | PETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|---------|
| .998 | -4.910 | -1.8020 | .01080 | .07490 | .03370 | -.00170 | -.00460 | .10610 | -.06200 | .04130 |
| .998 | .080 | -.19800 | .01270 | .07680 | .03640 | -.00060 | -.00080 | .02440 | -.06420 | .04040 |
| .998 | 5.280 | -.19600 | .01050 | .07510 | .02990 | .00060 | .00440 | -.10310 | -.05380 | .04320 |
| | GRADIENT | -.00361 | .00038 | .00038 | .00054 | .00022 | .00076 | -.02038 | -.00084 | -.00018 |

RUN NO. 189/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|--------|---------|---------|---------|---------|---------|
| .899 | -4.990 | -.21900 | .01500 | .09500 | .04630 | -.00330 | -.01200 | .13610 | -.06870 | .04870 |
| .899 | .080 | -.23700 | .01960 | .09420 | .05000 | -.00090 | -.00080 | .00470 | -.08280 | .04430 |
| .899 | 5.390 | -.23300 | .01560 | .09230 | .04520 | .00210 | .01070 | -.13120 | -.06690 | .04710 |
| | GRADIENT | -.00355 | .00091 | -.00016 | .00075 | .00047 | .00221 | -.02592 | -.00278 | -.00087 |

DATE 13 SEP 79 TABULATED SOURCE FORCE DATA-0412A

(RBP034) (07 MAY 73)

AWES 11-707 0412 02A

PARAMETRIC DATA

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

ALPHA = .000 ELEVON = .000
 RUDDER = .000 RUDFLR = 40.000

RUN NO. 184/ 0 RNVL = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|---------|---------|---------|---------|----------|--------|
| .999 | -7.990 | .00800 | .00730 | .07700 | .03440 | .00180 | -.00760 | .16540 | .94330 | .04260 |
| .999 | -3.950 | .00400 | .01130 | .08160 | .04130 | -.00040 | -.00380 | .08300 | 3.03620 | .04020 |
| .999 | .090 | -.01000 | .01350 | .08420 | .04320 | -.00060 | -.00070 | .00390 | -1.29100 | .03900 |
| .999 | 4.250 | -.00900 | .01150 | .08070 | .04040 | -.00100 | .00360 | -.08320 | -1.30600 | .04030 |
| .999 | 8.310 | -.00200 | .00790 | .07670 | .03320 | -.00190 | .00790 | -.16780 | -3.77000 | .04350 |
| | GRADIENT | -.00159 | .00002 | -.00011 | -.00011 | -.00007 | .00091 | -.02003 | -.53368 | .00001 |

RUN NO. 190/ 0 RNVL = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|---------|---------|---------|---------|---------|---------|
| .901 | -8.100 | .01000 | .00460 | .10020 | .05320 | -.00040 | -.01610 | .20340 | .46660 | .04710 |
| .901 | -4.010 | .01800 | .00880 | .10120 | .05370 | -.00160 | -.00930 | .10660 | .49980 | .04590 |
| .901 | .080 | .00500 | .01150 | .10110 | .05850 | -.00120 | -.00080 | .00500 | 2.30800 | .04260 |
| .901 | 4.250 | .00900 | .00900 | .09960 | .05450 | -.00010 | .00810 | -.09940 | 1.71700 | .04510 |
| .901 | 8.430 | .00100 | .00460 | .09950 | .05030 | -.00020 | .01590 | -.20270 | 5.07100 | .04920 |
| | GRADIENT | -.00157 | .00002 | -.00019 | -.00015 | .00016 | .00211 | -.02494 | .14642 | -.00005 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(RBP035) (07 MAY 73)

AVES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = .000
 RUDDER = .000 RUOFLR = 40.000

RUN NO. 185/ 0 RN/L = 3.99 GRADIENT INTERVAL = -3.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|--------|---------|---------|---------|--------|---------|
| .998 | -8.040 | .24800 | .00670 | .06860 | .02880 | .00510 | -.00790 | .16600 | .02720 | .04810 |
| .998 | -3.980 | .25000 | .00940 | .07190 | .03160 | .00070 | -.00370 | .08490 | .03760 | .04090 |
| .998 | .080 | .23900 | .01180 | .07440 | .03690 | -.00080 | -.00040 | .00430 | .05010 | .03790 |
| .998 | 4.170 | .23600 | .00990 | .07180 | .03260 | -.00210 | .00310 | -.07760 | .04210 | .03920 |
| .998 | 8.260 | .23600 | .00660 | .06740 | .02570 | -.00450 | .00810 | -.16720 | .02790 | .04170 |
| | GRADIENT | -.00172 | .00006 | -.00001 | .00012 | -.00034 | .00083 | -.01996 | .00055 | -.00013 |

RUN NO. 191/ 0 RN/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|---------|---------|---------|---------|---------|--------|---------|
| .903 | -8.160 | .28000 | .00090 | .09980 | .05370 | .00490 | -.01540 | .20040 | .00300 | .04600 |
| .903 | -4.040 | .28700 | .00360 | .09740 | .05510 | .00160 | -.00870 | .10280 | .01240 | .04220 |
| .903 | .080 | .27700 | .00590 | .09840 | .05810 | -.00110 | -.00060 | .00590 | .02110 | .04030 |
| .903 | 4.220 | .27600 | .00490 | .09660 | .05480 | -.00400 | .00720 | -.09090 | .01790 | .04180 |
| .903 | 8.370 | .26200 | .00320 | .09760 | .05270 | -.00680 | .01410 | -.19210 | .01220 | .04490 |
| | GRADIENT | -.00133 | .00016 | -.00010 | -.00004 | -.00068 | .00192 | -.02345 | .00066 | -.00005 |

REFERENCE DATA

SRF = 2.4210 90.FT.

LRF = 39.6490 IN.

BRF = 39.6490 IN.

SCALE = .0300 SCALE

YMRP = 32.3000 IN.

YMRP = .0000 IN.

ZMRP = .0000 IN.

ALPHA = 10.000

ELEVON = .000

RUDER = .000

RUDFLR = 40.000

PARAMETRIC DATA

| RUN NO. 186/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00 | | | | | | | | | |
|--|----------|---------|--------|--------|--------|---------|---------|---------|---------|
| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L |
| .599 | -8.070 | .31400 | .00310 | .04320 | .00030 | .00930 | -.00730 | .17100 | .00600 |
| .599 | -3.990 | .31800 | .00660 | .04640 | .00690 | .00360 | -.00400 | .09050 | .01270 |
| .599 | .060 | .52400 | .00790 | .05050 | .01270 | .00030 | -.00140 | .01050 | .01510 |
| .599 | 4.160 | .51000 | .00680 | .04870 | .00960 | -.00370 | .00160 | -.07260 | .01330 |
| .599 | 8.230 | .50800 | .00290 | .04550 | .00370 | -.00810 | .00630 | -.16340 | .00560 |
| | GRADIENT | -.00098 | .00002 | .00028 | .00033 | -.00092 | .00069 | -.02001 | .00007 |
| | | | | | | | | | CABO |
| | | | | | | | | | .04290 |
| | | | | | | | | | .03960 |
| | | | | | | | | | .03760 |
| | | | | | | | | | .03910 |
| | | | | | | | | | .04180 |
| | | | | | | | | | -.00006 |

| RUN NO. 192/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00 | | | | | | | | | |
|--|----------|---------|---------|--------|--------|---------|---------|---------|---------|
| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L |
| .902 | -8.170 | .54800 | -.00210 | .10170 | .05310 | .01200 | -.01310 | .19070 | -.00370 |
| .902 | -4.050 | .55500 | .00080 | .10130 | .05630 | .00580 | -.00740 | .09730 | .00150 |
| .902 | .080 | .55000 | .00120 | .10450 | .06270 | -.00100 | -.00100 | .00820 | .00220 |
| .902 | 4.200 | .54600 | .00080 | .10220 | .06010 | -.00690 | .00560 | -.08110 | .00150 |
| .902 | 8.330 | .53800 | -.00110 | .10130 | .05570 | -.01180 | .01230 | -.18200 | -.00210 |
| | GRADIENT | -.00109 | .00000 | .00011 | .00046 | -.00154 | .00158 | -.02162 | .00000 |
| | | | | | | | | | CABO |
| | | | | | | | | | .04860 |
| | | | | | | | | | .04500 |
| | | | | | | | | | .04170 |
| | | | | | | | | | .04220 |
| | | | | | | | | | .04570 |
| | | | | | | | | | -.00034 |

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REFERENCE DATA
 SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA
 ALPHA = 15.000 ELEVON = .000
 RUDDER = .000 RUOFLR = 40.000

| RUN NO. 187/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00 | | | | | | | | | | | |
|--|----------|---------|---------|---------|--------|---------|---------|---------|---------|---------|--|
| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO | |
| .596 | -8.090 | .76900 | -.00090 | .05570 | .00900 | .01210 | -.00700 | .17220 | -.00120 | .04680 | |
| .596 | -3.990 | .76700 | .00290 | .06080 | .01800 | .00370 | -.00320 | .09130 | .00380 | .04280 | |
| .596 | .080 | .75800 | .00290 | .06570 | .02200 | -.00170 | -.00130 | .01260 | .00390 | .04380 | |
| .596 | 4.160 | .75900 | .00270 | .05940 | .01820 | -.00620 | .00050 | -.07150 | .00360 | .04120 | |
| .596 | 8.230 | .75700 | -.00090 | .05240 | .00930 | -.01170 | .00350 | -.16340 | -.00120 | .04320 | |
| | GRADIENT | -.00098 | -.00002 | -.00017 | .00002 | -.00121 | .00045 | -.01998 | -.00002 | -.00020 | |
| RUN NO. 193/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00 | | | | | | | | | | | |
| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO | |
| .899 | -8.150 | .78700 | -.01000 | .10680 | .05520 | .01130 | -.00910 | .18040 | -.01280 | .05160 | |
| .899 | -4.030 | .79300 | -.00900 | .10870 | .06030 | .00490 | -.00350 | .08660 | -.01140 | .04840 | |
| .899 | .070 | .78000 | -.00850 | .11160 | .06380 | .00150 | -.00100 | .00820 | -.01080 | .04780 | |
| .899 | 4.200 | .77700 | -.00840 | .10770 | .06080 | -.00600 | .00310 | -.07460 | -.01080 | .04690 | |
| .899 | 8.330 | .76500 | -.00910 | .10570 | .05730 | -.01210 | .00920 | -.17230 | -.01190 | .04840 | |
| | GRADIENT | -.00158 | .00007 | -.00012 | .00006 | -.00132 | .00080 | -.01959 | .00007 | -.00018 | |

REFERENCE DATA

| | | | | | |
|---------|-------------|--------|-------|---------|-----|
| SRF = | 2.4210 | 59.FT. | XRP = | 32.3000 | IN. |
| LEF = | 39.8490 | IN. | YRP = | .0000 | IN. |
| BRF = | 39.8490 | IN. | ZRP = | .0000 | IN. |
| SCALE = | .0000 SCALE | | | | |

PARAMETRIC DATA

| | | | |
|----------|--------|----------|--------|
| ALPHA = | 25.000 | ELEVON = | .000 |
| RUDDER = | .000 | RUDFLR = | 40.000 |

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

GRADIENT INTERVAL = -5.00/ 5.00

| | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CABO |
|----------|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| MACH | | | | | | | | | | |
| .899 | -8.080 | 1.00900 | -.00800 | .10830 | .05040 | .01260 | .00400 | .14100 | -.00790 | .05790 |
| .899 | -3.990 | 1.02500 | -.00310 | .11290 | .05590 | .00720 | .00730 | .05980 | -.00490 | .05650 |
| .899 | .080 | 1.02000 | -.00320 | .11540 | .06090 | .00140 | -.00030 | .00300 | -.00510 | .05440 |
| .899 | 4.220 | 1.00500 | -.00710 | .11080 | .05850 | -.00400 | .00870 | -.05370 | -.00710 | .05230 |
| .899 | 8.360 | 1.00600 | -.00790 | .10900 | .05410 | -.01330 | .00460 | -.13320 | -.00790 | .05690 |
| GRADIENT | | | | -.00021 | .00031 | -.00136 | -.00195 | -.01370 | -.00027 | -.00051 |

DATE 13 SEP 75

TABULATED SOURCE FORCE DATA-0A12A

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(RBP039) (07 MAY 75)

AMES 11-707 0A12 02A

REFERENCE DATA

XREF = 2.4210 SQ.FT.
 YREF = 39.8490 IN.
 ZREF = 39.8490 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

BETA = .000 ELEVON = .000
 RUDDER = .000 RUDFLR = .000

RUN NO. 199/ 0 RVN/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|-------|----------|--------|---------|--------|--------|---------|---------|--------|---------|---------|
| 1.099 | -4.550 | -22800 | .01080 | .13360 | .07390 | -.00050 | -.00100 | .00480 | -.04750 | .05770 |
| 1.247 | -3.520 | -16700 | .00810 | .13900 | .07830 | -.00050 | -.00080 | .00430 | -.04830 | .05670 |
| 1.099 | -1.490 | -04600 | .00180 | .13680 | .08050 | -.00030 | -.00090 | .00460 | -.03940 | .05630 |
| 1.099 | .540 | .08700 | -.00640 | .13930 | .08300 | -.00040 | -.00090 | .00610 | -.07380 | .05620 |
| 1.099 | 2.510 | .21900 | -.01520 | .14140 | .08470 | -.00080 | -.00100 | .00740 | -.07980 | .05670 |
| 1.099 | 4.050 | .30800 | -.02110 | .14190 | .08550 | -.00080 | -.00090 | .00730 | -.06860 | .05630 |
| 1.099 | 6.630 | .46000 | -.02870 | .14140 | .08390 | -.00050 | -.00070 | .00690 | -.06240 | .05750 |
| 1.099 | 8.590 | .56900 | -.03220 | .14060 | .08120 | -.00090 | -.00070 | .00760 | -.05670 | .05940 |
| 1.099 | 9.970 | .64500 | -.03460 | .14060 | .08050 | -.00080 | -.00080 | .00780 | -.05360 | .06010 |
| 1.099 | 14.970 | .91400 | -.04180 | .14540 | .07980 | -.00040 | -.00080 | .00900 | -.04570 | .06570 |
| 1.099 | GRADIENT | .06278 | -.00378 | .00100 | .00110 | -.00004 | -.00000 | .00037 | -.00336 | -.00009 |

RUN NO. 197/ 0 RVN/L = 2.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|-------|----------|--------|---------|--------|--------|---------|---------|--------|---------|---------|
| 1.247 | -4.440 | -20400 | .01190 | .13300 | .08180 | -.00040 | -.00090 | .00360 | -.05870 | .05140 |
| 1.247 | -3.470 | -14400 | .00740 | .13440 | .08350 | -.00050 | -.00080 | .00340 | -.05160 | .05100 |
| 1.247 | -1.470 | -02600 | -.00140 | .13750 | .08720 | -.00030 | -.00080 | .00270 | -.05540 | .05330 |
| 1.247 | .520 | .09500 | -.01050 | .14020 | .08950 | -.00040 | -.00070 | .00320 | -.05070 | .05570 |
| 1.247 | 2.580 | .21200 | -.01910 | .14160 | .08880 | -.00060 | -.00070 | .00610 | -.09020 | .05180 |
| 1.247 | 4.570 | .32100 | -.02600 | .14050 | .08880 | -.00100 | -.00070 | .00660 | -.08100 | .05170 |
| 1.247 | 6.670 | .43700 | -.03190 | .13950 | .08690 | -.00090 | -.00050 | .00660 | -.07390 | .05260 |
| 1.247 | 8.660 | .54800 | -.03700 | .13960 | .08560 | -.00060 | -.00060 | .00680 | -.06760 | .05400 |
| 1.247 | 10.030 | .62400 | -.03910 | .13900 | .08440 | -.00030 | -.00060 | .00750 | -.05260 | .05460 |
| 1.247 | 14.980 | .89500 | -.04620 | .14230 | .08270 | -.00130 | -.00130 | .01150 | -.05170 | .05970 |
| 1.247 | GRADIENT | .05845 | -.00426 | .00093 | .00085 | -.00005 | .00002 | .00040 | -.00649 | -.00008 |

RUN NO. 195/ 0 RVN/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|-------|----------|--------|---------|--------|--------|---------|---------|--------|---------|---------|
| 1.398 | -4.420 | -18100 | .00610 | .13720 | .08730 | -.00020 | -.00060 | .00300 | -.00380 | .04990 |
| 1.398 | -3.420 | -12800 | .00250 | .13830 | .08910 | -.00030 | -.00040 | .00350 | -.01950 | .04920 |
| 1.398 | -1.430 | -02000 | -.00510 | .13940 | .09120 | -.00030 | -.00050 | .00290 | -.00980 | .04820 |
| 1.398 | .520 | .08400 | -.01220 | .14010 | .09280 | -.00040 | -.00070 | .00400 | -.01450 | .04770 |
| 1.398 | 2.600 | .19100 | -.01910 | .14040 | .09290 | -.00040 | -.00060 | .00550 | -.00990 | .04750 |
| 1.398 | 4.570 | .29100 | -.02520 | .13910 | .09120 | -.00020 | -.00040 | .00650 | -.00680 | .04790 |
| 1.398 | 6.440 | .38500 | -.02950 | .13720 | .08920 | -.00060 | -.00030 | .00720 | -.00760 | .04820 |
| 1.398 | 8.710 | .49900 | -.03490 | .13600 | .08670 | -.00080 | -.00030 | .00720 | -.00690 | .04930 |
| 1.398 | 10.110 | .57700 | -.03910 | .13680 | .08680 | -.00110 | -.00050 | .00630 | -.00670 | .05000 |
| 1.398 | 15.030 | .83400 | -.04940 | .13620 | .08350 | -.00140 | -.00060 | .00810 | -.00520 | .05270 |
| 1.398 | GRADIENT | .05263 | -.00351 | .00024 | .00048 | -.00000 | .00000 | .00040 | -.01515 | -.00024 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

PAGE 40

(REMOVED) (07 MAY 75)

ANES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 94. FT.
 LREF = 39.6490 IN.
 BREF = 39.6490 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

ALPHA = .500 ELEVON = .000
 RUDDER = .000 RUDDLR = .000

RUN NO. 200/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| 1.099 | -8.080 | .09300 | -.01140 | .13560 | .07610 | .00660 | -.00590 | .16400 | -.11920 | .05940 |
| 1.099 | -4.000 | .08900 | -.00750 | .13800 | .08080 | .00360 | -.00450 | .08350 | -.08200 | .05720 |
| 1.099 | -1.960 | .08900 | -.00720 | .13900 | .08250 | .00130 | -.00270 | .04340 | -.08000 | .05690 |
| 1.099 | .080 | .08200 | -.00610 | .13890 | .08280 | -.00050 | -.00090 | .00640 | -.07380 | .05610 |
| 1.099 | 2.150 | .08300 | -.00650 | .13860 | .08270 | -.00260 | .00110 | -.03200 | -.07830 | .05600 |
| 1.099 | 4.230 | .08200 | -.00680 | .13710 | .08190 | -.00420 | .00290 | -.07270 | -.08320 | .05520 |
| 1.099 | 8.390 | .08200 | -.01020 | .13490 | .07840 | -.00590 | .00430 | -.19700 | -.12350 | .05650 |
| GRADIENT | | -.00097 | .00010 | -.00011 | .00012 | -.00095 | .00090 | -.01885 | .00017 | -.07222 |

RUN NO. 198/ 0 RV/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| 1.250 | -8.040 | .09300 | -.01160 | .13970 | .08300 | .00530 | -.00240 | .15680 | -.12670 | .05670 |
| 1.250 | -3.970 | .09900 | -.01090 | .14010 | .08640 | .00220 | -.00280 | .08120 | -.10970 | .05370 |
| 1.250 | -1.940 | .09600 | -.01080 | .14030 | .08820 | .00090 | -.00180 | .04240 | -.11290 | .05210 |
| 1.250 | .080 | .09400 | -.01020 | .14020 | .08900 | -.00040 | -.00070 | .00630 | -.10860 | .05120 |
| 1.250 | 2.140 | .09300 | -.01000 | .14030 | .08940 | -.00160 | .00050 | -.03130 | -.10760 | .05090 |
| 1.250 | 4.210 | .08700 | -.00990 | .14040 | .08870 | -.00290 | .00130 | -.06890 | -.11450 | .05180 |
| 1.250 | 8.340 | .07700 | -.01060 | .13920 | .08540 | -.00460 | .00170 | -.15080 | -.13750 | .05380 |
| GRADIENT | | -.00132 | .00014 | .00003 | .00028 | -.00062 | .00051 | -.01829 | -.08024 | -.07224 |

RUN NO. 196/ 0 RV/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| 1.396 | -8.040 | .07000 | -.01340 | .14180 | .08860 | .00350 | -.00050 | .15370 | -.19050 | .05320 |
| 1.396 | -3.970 | .07300 | -.01180 | .14060 | .09080 | .00150 | -.00190 | .07630 | -.16240 | .04990 |
| 1.396 | .080 | .06900 | -.01120 | .13990 | .09270 | -.00020 | -.00050 | .00650 | -.16180 | .04720 |
| 1.396 | 4.210 | .06600 | -.01100 | .14230 | .09330 | -.00180 | .00020 | -.05750 | -.16670 | .04920 |
| 1.396 | 8.360 | .05800 | -.01170 | .14270 | .09030 | -.00290 | -.00080 | -.19700 | -.19980 | .05240 |
| GRADIENT | | -.00086 | .00010 | .00021 | .00031 | -.00040 | .00026 | -.01758 | -.07553 | -.06011 |

(RBP041) (07 MAY 73)

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0412A

AKES 11-707 0412 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = -10.000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.5000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 201/ 0 RM/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| .800 | -4.910 | -.14700 | .00020 | .04480 | .01040 | -.00770 | .00710 | .07260 | -.00140 | .03440 |
| .800 | .090 | -.16300 | .00160 | .04790 | .01680 | -.00390 | .00960 | -.02330 | -.01010 | .03110 |
| .600 | 5.280 | -.15900 | -.00090 | .04470 | .00970 | -.00420 | .01230 | -.12620 | .00300 | .03500 |
| | GRADIENT | -.00320 | .00026 | .00062 | .00126 | .00036 | .00050 | -.01958 | -.00174 | -.00266 |

RUN NO. 202/ 0 RM/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|---------|--------|--------|--------|---------|--------|---------|---------|---------|
| .901 | -4.990 | -.18300 | .00280 | .06680 | .02990 | -.00710 | .00420 | .11480 | -.01530 | .03680 |
| .901 | .090 | -.16800 | .00560 | .06890 | .03350 | -.00300 | .00420 | -.01180 | -.02980 | .03540 |
| .901 | 5.360 | -.19400 | .00270 | .06610 | .02800 | .00070 | .01500 | -.14610 | -.01400 | .03810 |
| | GRADIENT | -.00298 | .00055 | .00041 | .00071 | .00081 | .00165 | -.02492 | -.00285 | -.00228 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(RBP042) (07 MAY 73)

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = -20.000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 59.FT. XMRP = 32.3500 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 203/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CASO |
|----------|--------|---------|--------|--------|--------|---------|--------|---------|---------|---------|
| .996 | -4.900 | -.15500 | .00260 | .05280 | .01800 | -.01110 | .01420 | .05110 | -.01680 | .03480 |
| .996 | .100 | -.16900 | .00350 | .05640 | .02250 | -.00640 | .01900 | -.04300 | -.02070 | .03390 |
| .996 | 5.290 | -.16500 | .00140 | .05290 | .01540 | -.00710 | .01890 | -.14610 | -.02650 | .03760 |
| GRADIENT | | -.00280 | .00018 | .00072 | .00090 | .00234 | .00016 | -.01992 | -.00078 | -.00018 |

RUN NO. 204/ 0 RV/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCF/L | CASO |
|----------|--------|---------|--------|--------|--------|---------|--------|---------|---------|---------|
| .901 | -4.980 | -.18300 | .00470 | .07900 | .03390 | -.00960 | .00010 | .02270 | -.02370 | .03910 |
| .901 | .100 | -.19600 | .00820 | .07590 | .03790 | -.00590 | .00990 | -.02730 | -.04490 | .03800 |
| .901 | 5.360 | -.20100 | .00550 | .07570 | .03430 | -.00300 | .02230 | -.16590 | -.02740 | .04140 |
| GRADIENT | | -.00256 | .00069 | .00049 | .00071 | .00073 | .00193 | -.02559 | -.00317 | -.00022 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(REPROD) 1 07 MAY 73

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = 10.000
RUCRER = .000 RUCFLR = .000

REFERENCE DATA

SREF = 2.4210 50.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
SREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 205/ 0 RM/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CV | KCP/L | CABO |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| .600 | -4.910 | .05900 | -.03670 | .06300 | .02720 | -.00160 | -.00390 | .10980 | -.75900 | .03580 |
| .800 | .080 | .04100 | -.03780 | .06540 | .03100 | -.00070 | -.00030 | .00800 | -.91400 | .03430 |
| .900 | 5.270 | .04100 | -.03910 | .06190 | .02460 | .00040 | .00390 | -.05940 | -.96390 | .03880 |
| GRADIENT | | -.00281 | .00022 | .00048 | .00076 | .00018 | .00072 | -.02016 | -.04100 | -.00030 |

RUN NO. 206/ 0 RM/L = 4.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CV | KCP/L | CABO |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| .903 | -4.980 | -.02800 | -.03290 | .08300 | .04070 | -.00090 | -.00430 | .11010 | 1.15100 | .04230 |
| .903 | .080 | -.04300 | -.02970 | .08310 | .04680 | -.00060 | .00070 | -.00020 | .68370 | .02530 |
| .903 | 5.340 | -.04700 | -.03180 | .08090 | .04060 | .00060 | .00420 | -.10770 | .68130 | .03380 |
| GRADIENT | | -.00296 | .00055 | .00002 | .00121 | .00004 | .00099 | -.02180 | -.09235 | -.00119 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

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(08P044) (07 MAY 75)

ANES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0200 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = -10.000
 RUDDER = .000 RUFLR = .000

RUN NO. 207/ 0 RV/L = 3.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|---------|
| .597 | -4.910 | -.35200 | .03490 | .04170 | .01430 | -.00290 | -.00190 | .09480 | -.09910 | .02720 |
| .597 | .080 | -.37000 | .03660 | .04390 | .01690 | -.00060 | .00000 | .00210 | -.09900 | .02690 |
| .597 | 5.270 | -.36600 | .03460 | .04090 | .01430 | .00210 | .00250 | -.09510 | -.09460 | .02660 |
| | GRADIENT | -.00361 | .00034 | .00044 | .00048 | .00046 | .00038 | -.01859 | .00002 | -.00006 |

RUN NO. 208/ 0 RV/L = 4.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CASO |
|------|----------|---------|--------|--------|--------|---------|---------|---------|---------|---------|
| .904 | -4.980 | -.36100 | .04390 | .07530 | .04210 | -.00430 | -.00490 | .11140 | -.12170 | .03320 |
| .904 | .090 | -.37700 | .04710 | .07790 | .04570 | -.00140 | .00080 | -.02100 | -.12470 | .03160 |
| .904 | 5.340 | -.38900 | .04460 | .07540 | .04070 | .00390 | .00460 | -.11170 | -.11790 | .03270 |
| | GRADIENT | -.00316 | .00063 | .00059 | .00071 | .00057 | .00112 | -.02217 | -.00039 | -.00032 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

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(RBP845) (07 MAY 73)

AVES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 50.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
 RUDDER = .000 RUOFLR = .000

RUN NO. 210/ 0 RV/L = 3.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|----------|--------|--------|--------|---------|--------|---------|---------|---------|
| .998 | -4.910 | -1.14700 | .00080 | .04270 | .00930 | -.00280 | .09680 | .03340 | .00530 | .03340 |
| .996 | .090 | -1.16000 | .00080 | .04310 | .01370 | -.00070 | .00000 | .03140 | -.00510 | .03140 |
| .998 | 5.280 | -1.15800 | .00090 | .04180 | .00800 | .00090 | .00310 | .03380 | .00590 | .03380 |
| | GRADIENT | -.00260 | .00032 | .00048 | .00088 | .00026 | .00056 | -.01960 | -.00212 | -.00040 |

RUN NO. 209/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | XCP/L | CABO |
|------|----------|----------|--------|--------|--------|---------|--------|---------|---------|---------|
| .901 | -5.000 | -1.18100 | .00190 | .06330 | .02930 | -.00630 | .12270 | .03600 | -.01030 | .03600 |
| .901 | .090 | -1.18900 | .00480 | .06670 | .03150 | -.00120 | .00090 | .03530 | -.02550 | .03530 |
| .901 | 5.350 | -1.19300 | .00160 | .06250 | .02600 | .00300 | .00660 | .03650 | -.00810 | .03650 |
| | GRADIENT | -.00157 | .00057 | .00028 | .00043 | .00100 | .00143 | -.02446 | -.00299 | -.00014 |

REFERENCE DATA

| | | | |
|---------|---------------|--------|-------------|
| 3REF = | 2.4210 90.FT. | 30RP = | 32.3000 IN. |
| 1REF = | 39.8493 IN. | 10RP = | .0000 IN. |
| 0REF = | 39.8493 IN. | 20RP = | .0000 IN. |
| SCALE = | .0303 SCALE | | |

PARAMETRIC DATA

| | | | | | |
|--------|---|------|--------|---|------|
| BETA | = | .000 | ELEVON | = | .000 |
| RUDER2 | = | .000 | RUDFLR | = | .000 |

RUN NO. 216/ 0 RS/L = 4.02 GRADIENT INTERVAL = -5.00' 5.00

[illegible]

| POINT NO. | 211/ 0 | RN/L = 4.51 | GRADIENT INTERVAL = -5.00/ 5.00 |
|-----------|--------|-------------|---------------------------------|
| 1 | 10.00 | 10.00 | 10.00 |
| 2 | 10.00 | 10.00 | 10.00 |
| 3 | 10.00 | 10.00 | 10.00 |
| 4 | 10.00 | 10.00 | 10.00 |
| 5 | 10.00 | 10.00 | 10.00 |
| 6 | 10.00 | 10.00 | 10.00 |
| 7 | 10.00 | 10.00 | 10.00 |
| 8 | 10.00 | 10.00 | 10.00 |
| 9 | 10.00 | 10.00 | 10.00 |
| 10 | 10.00 | 10.00 | 10.00 |
| 11 | 10.00 | 10.00 | 10.00 |
| 12 | 10.00 | 10.00 | 10.00 |
| 13 | 10.00 | 10.00 | 10.00 |
| 14 | 10.00 | 10.00 | 10.00 |
| 15 | 10.00 | 10.00 | 10.00 |
| 16 | 10.00 | 10.00 | 10.00 |
| 17 | 10.00 | 10.00 | 10.00 |
| 18 | 10.00 | 10.00 | 10.00 |
| 19 | 10.00 | 10.00 | 10.00 |
| 20 | 10.00 | 10.00 | 10.00 |
| 21 | 10.00 | 10.00 | 10.00 |
| 22 | 10.00 | 10.00 | 10.00 |
| 23 | 10.00 | 10.00 | 10.00 |
| 24 | 10.00 | 10.00 | 10.00 |
| 25 | 10.00 | 10.00 | 10.00 |
| 26 | 10.00 | 10.00 | 10.00 |
| 27 | 10.00 | 10.00 | 10.00 |
| 28 | 10.00 | 10.00 | 10.00 |
| 29 | 10.00 | 10.00 | 10.00 |
| 30 | 10.00 | 10.00 | 10.00 |
| 31 | 10.00 | 10.00 | 10.00 |
| 32 | 10.00 | 10.00 | 10.00 |
| 33 | 10.00 | 10.00 | 10.00 |
| 34 | 10.00 | 10.00 | 10.00 |
| 35 | 10.00 | 10.00 | 10.00 |
| 36 | 10.00 | 10.00 | 10.00 |
| 37 | 10.00 | 10.00 | 10.00 |
| 38 | 10.00 | 10.00 | 10.00 |
| 39 | 10.00 | 10.00 | 10.00 |
| 40 | 10.00 | 10.00 | 10.00 |
| 41 | 10.00 | 10.00 | 10.00 |
| 42 | 10.00 | 10.00 | 10.00 |
| 43 | 10.00 | 10.00 | 10.00 |
| 44 | 10.00 | 10.00 | 10.00 |
| 45 | 10.00 | 10.00 | 10.00 |
| 46 | 10.00 | 10.00 | 10.00 |
| 47 | 10.00 | 10.00 | 10.00 |
| 48 | 10.00 | 10.00 | 10.00 |
| 49 | 10.00 | 10.00 | 10.00 |
| 50 | 10.00 | 10.00 | 10.00 |
| 51 | 10.00 | 10.00 | 10.00 |
| 52 | 10.00 | 10.00 | 10.00 |
| 53 | 10.00 | 10.00 | 10.00 |
| 54 | 10.00 | 10.00 | 10.00 |
| 55 | 10.00 | 10.00 | 10.00 |
| 56 | 10.00 | 10.00 | 10.00 |
| 57 | 10.00 | 10.00 | 10.00 |
| 58 | 10.00 | 10.00 | 10.00 |
| 59 | 10.00 | 10.00 | 10.00 |
| 60 | 10.00 | 10.00 | 10.00 |
| 61 | 10.00 | 10.00 | 10.00 |
| 62 | 10.00 | 10.00 | 10.00 |
| 63 | 10.00 | 10.00 | 10.00 |
| 64 | 10.00 | 10.00 | 10.00 |
| 65 | 10.00 | 10.00 | 10.00 |
| 66 | 10.00 | 10.00 | 10.00 |
| 67 | 10.00 | 10.00 | 10.00 |
| 68 | 10.00 | 10.00 | 10.00 |
| 69 | 10.00 | 10.00 | 10.00 |
| 70 | 10.00 | 10.00 | 10.00 |
| 71 | 10.00 | 10.00 | 10.00 |
| 72 | 10.00 | 10.00 | 10.00 |
| 73 | 10.00 | 10.00 | 10.00 |
| 74 | 10.00 | 10.00 | 10.00 |
| 75 | 10.00 | 10.00 | 10.00 |
| 76 | 10.00 | 10.00 | 10.00 |
| 77 | 10.00 | 10.00 | 10.00 |
| 78 | 10.00 | 10.00 | 10.00 |
| 79 | 10.00 | 10.00 | 10.00 |
| 80 | 10.00 | 10.00 | 10.00 |
| 81 | 10.00 | 10.00 | 10.00 |
| 82 | 10.00 | 10.00 | 10.00 |
| 83 | 10.00 | 10.00 | 10.00 |
| 84 | 10.00 | 10.00 | 10.00 |

[illegible]

FABRICATED SOURCE FORCE DATA-QA:EA

AMES 11-707 0A12 OPA INVERTED

PARAMETRIC DATA

| | | | |
|----------|--------|----------|------|
| ALPHA = | -5.000 | ELEVON = | .000 |
| BUDGER = | .000 | RUDFLR = | .000 |

REFERENCE DATA

| | | | |
|---------|---------------|--------|-------------|
| SREF = | 2.4210 SQ.FT. | YARP = | 32.3000 IN. |
| LEEF = | 39.8430 IN. | YARP = | .0000 IN. |
| MEEF = | 39.8430 IN. | ZARP = | .0300 IN. |
| SCALE = | .0330 SCALE | | |

GRADIENT INTERVAL = -5.00/ 5.00

[illegible]

CONFIDENCE INTERVAL = -5.00/ 5.00

[illegible]

(RBP048) (07 MAY 73)

AMES 11-707 OA12 02A INVERTED

REFERENCE DATA

| | | | | | |
|---------|---------|--------|--------|---------|-----|
| SREF = | 2.4210 | 59.FT. | XRRP = | 32.3000 | IN. |
| LREF = | 39.8490 | IN. | YRRP = | .0000 | IN. |
| BREF = | 39.8490 | IN. | ZRRP = | .0000 | IN. |
| SCALE = | .0300 | SCALE | | | |

PARAMETRIC DATA

| | | | |
|----------|---------|----------|------|
| ALPHA = | -10.00% | ELEVON = | .000 |
| RUDDER = | .500 | RUOFLR = | .000 |

| | END | START | GRADIENT INTERVAL = |
|---|------|-------|---------------------|
| 1 | 0.00 | -5.00 | 5.00 |

[illegible]

| Iteration | Value | Delta | Gradient Interval |
|-----------|-------|-------|-------------------|
| 1 | 5.00 | -5.00 | 4.17 |

[illegible]

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

PAGE 49

(ABP001) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SP-EP = 2.4210 SQ.FT.
 LF-EP = 39.8490 IN.
 BR-EP = 39.8490 IN.
 SCALE = .0300 SCALE

XMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

PARAMETRIC DATA

BETA = .000 ELEVON = .000
 RUDDER = .000 RUOFLR = .000

RUN NO. 119/ 0 RVL = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/D |
|------|----------|---------|---------|----------|
| .600 | -4.410 | -.18250 | .02790 | -6.55100 |
| .600 | .030 | .02370 | .02220 | 1.07000 |
| .600 | 5.030 | .26910 | .03460 | 7.77700 |
| .600 | 10.040 | .53470 | .08410 | 6.35700 |
| .600 | 15.020 | .76110 | .20610 | 3.69300 |
| .600 | 20.000 | 1.01800 | .37270 | 2.75100 |
| .600 | 22.580 | 1.10800 | .45610 | 2.43000 |
| | GRADIENT | .04644 | -.00128 | 1.71644 |

RUN NO. 125/ 0 RVL = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/D |
|------|----------|---------|--------|----------|
| .905 | -4.560 | -.22230 | .04920 | -4.51800 |
| .905 | -.010 | .04790 | .04030 | 1.18800 |
| .905 | 4.980 | .30370 | .06580 | 4.61900 |
| .905 | 9.990 | .53350 | .13640 | 3.91000 |
| .905 | 14.990 | .76900 | .25160 | 3.05600 |
| .905 | 20.020 | .96850 | .39710 | 2.43900 |
| .905 | 25.040 | 1.00900 | .50210 | 2.01000 |
| | GRADIENT | .05507 | .00179 | .95341 |

(ABP002) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A
AWES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = .000 ELEVON = .000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREP = 2.4210 90.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 120/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|---------|
| .598 | -10.010 | .04950 | .01020 | 4.47400 |
| .598 | -4.960 | .04450 | .01810 | 2.46000 |
| .598 | 5.230 | .02870 | .01670 | 1.71600 |
| .598 | 10.370 | .03340 | .00750 | 4.46400 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 126/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|---------|
| .904 | -10.150 | .02660 | .03270 | .81280 |
| .904 | -5.040 | .04940 | .03770 | 1.31200 |
| .904 | 5.290 | .04190 | .03560 | 1.17700 |
| .904 | 10.500 | .01560 | .02960 | .52650 |
| | GRADIENT | .00792 | .00673 | .22250 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

PAGE 51

(ABP003) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 50.FT.
LREF = 19.8490 IN.
BREF = 19.8490 IN.
SCALE = .0300 SCALE

XGRP = 32.3000 IN.
YGRP = .0000 IN.
ZGRP = .0000 IN.

ALPHA = 5.000 ELEVON = .000
RUDDER = .000 RUDDFLR = .000

PARAMETRIC DATA

RUN NO. 121/ 0 RM/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|----------|
| .596 | -10.080 | .27570 | .02310 | 11.92000 |
| .596 | -4.990 | .28030 | .03120 | 8.97700 |
| .596 | 5.190 | .26730 | .03310 | 8.88700 |
| .596 | 10.300 | .27200 | .02900 | 11.84000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 127/ 0 RM/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|---------|
| .904 | -10.210 | .28620 | .05690 | 5.03000 |
| .904 | -5.070 | .30720 | .06110 | 5.03100 |
| .904 | 5.250 | .29430 | .06360 | 4.85400 |
| .904 | 10.430 | .27430 | .05360 | 5.11600 |
| | GRADIENT | .05606 | .01154 | .92457 |

TABULATED SOURCE FORCE DATA-0A12A
AVES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 94.FT.
LREF = 39.3490 IN.
BREF = 39.3490 IN.
SCALE = .1300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
RUDDER = .000 RUDDLR = .000

RUN NO. 122/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|--------|--------|---------|
| .597 | -10.110 | .55120 | .07510 | 7.31700 |
| .597 | -5.020 | .56180 | .08310 | 6.75900 |
| .597 | 5.170 | .55510 | .08410 | 6.59600 |
| .597 | 10.270 | .54860 | .07610 | 7.17200 |
| | GRADIENT | .10737 | .01619 | 1.27582 |

RUN NO. 128/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|--------|--------|---------|
| .902 | -10.230 | .52440 | .12610 | 4.15300 |
| .902 | -5.070 | .53410 | .13110 | 4.04800 |
| .902 | 5.230 | .53230 | .13310 | 3.97800 |
| .902 | 10.390 | .51690 | .12610 | 4.10100 |
| | GRADIENT | .10172 | .02516 | .76061 |

(ABP005) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AVES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
RUDDER = .000 RUSSFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8430 IN.
BREF = 39.8430 IN.
SCALZ = .0330 SCALE

RUN NO. 123/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|---------|
| .599 | -10.090 | .75710 | .19260 | 3.92700 |
| .599 | -5.000 | .77230 | .20500 | 3.76800 |
| .599 | 5.180 | .76260 | .20060 | 3.79700 |
| .599 | 10.290 | .75610 | .18900 | 3.99400 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 129/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|---------|
| .904 | -10.200 | .76410 | .24350 | 3.13800 |
| .904 | -5.000 | .77990 | .25350 | 3.07900 |
| .904 | 5.220 | .75990 | .24770 | 3.06600 |
| .904 | 10.390 | .75060 | .24310 | 3.08700 |
| | GRADIENT | .14590 | .04745 | .58736 |

(ASFO06) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A
AMES 11-707 0A12 02A

PARAMETRIC DATA
ALPHA = 20.000 ELEVON = .000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0000 SCALE

RUN NO. 124/ 0 RM/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|---------|--------|---------|
| .599 | -10.030 | 1.02800 | .36250 | 2.83200 |
| .599 | -4.970 | 1.02800 | .36590 | 2.80500 |
| .599 | 5.210 | 1.01000 | .36330 | 2.78100 |
| .599 | 10.360 | 1.01000 | .35400 | 2.85400 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 130/ 0 RM/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|--------|--------|---------|
| .902 | -10.110 | .95850 | .38300 | 2.50300 |
| .902 | -5.020 | .97400 | .39440 | 2.46900 |
| .902 | 5.260 | .96000 | .39400 | 2.43700 |
| .902 | 10.430 | .94110 | .37970 | 2.47800 |
| | GRADIENT | .18255 | .07490 | .46331 |

(ABP007) (07 MAY 75)

TABULATED SOURCE FORCE DATA-QA12A

ANES 11-707 OA12 OZA

PARAMETRIC DATA

ALPHA = .000 ELEVON = .000
RUDDER = -10.000 RUFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 131/ 0 RM/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/Df |
|------|----------|---------|--------|---------|
| .600 | -7.980 | .03440 | .01470 | 2.54600 |
| .600 | -3.940 | .03060 | .02070 | 1.47900 |
| .600 | .090 | .02110 | .02460 | .85810 |
| .600 | 4.210 | .02170 | .02150 | 1.01200 |
| .600 | 8.320 | .02610 | .01410 | 1.83200 |
| | GRADIENT | -.00109 | .00009 | -.05695 |

RUN NO. 136/ 0 RM/L = 4.52 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/Df |
|------|----------|---------|---------|---------|
| .902 | -8.090 | .02810 | .03440 | .81530 |
| .902 | -4.000 | .04160 | .03920 | 1.06000 |
| .902 | .090 | .04360 | .04250 | 1.01600 |
| .902 | 4.260 | .03550 | .03810 | .93410 |
| .902 | 8.440 | .02050 | .03320 | .61140 |
| | GRADIENT | -.00074 | -.00014 | -.01526 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0412A

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(AS9028) (07 MAY 75)

AMES 11-707 0412 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

ALPHA = 9.093 ELEVON = .000

RUDDER = -10.000 RUFLR = .000

PARAMETRIC DATA

RUN NO. 132/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|---------|---------|
| .601 | -6.040 | .27370 | .02840 | 9.63300 |
| .601 | -3.970 | .27470 | .03310 | 8.30600 |
| .601 | .090 | .26470 | .03990 | 7.35700 |
| .601 | 4.180 | .26290 | .03250 | 6.09700 |
| .601 | 8.260 | .26680 | .02820 | 9.45700 |
| | GRADIENT | -.00145 | -.00007 | -.02662 |

RUN NO. 137/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|---------|---------|
| .901 | -8.140 | .29350 | .05910 | 4.96800 |
| .901 | -4.030 | .30490 | .06590 | 4.62600 |
| .901 | .090 | .29770 | .06770 | 4.43800 |
| .901 | 4.220 | .29710 | .06480 | 4.58200 |
| .901 | 8.370 | .28210 | .06000 | 4.70200 |
| | GRADIENT | -.00095 | -.00013 | -.00532 |

(ASP525) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0412A

AVES 11-707 0412 OZA

DATE 13 SEP 73

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

RUN NO. 133/ 0 RV/L = 3.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/D |
|------|----------|---------|--------|---------|
| .599 | -8.060 | .53430 | .07270 | 7.34500 |
| .599 | -3.980 | .54000 | .07400 | 6.83900 |
| .599 | .090 | .55070 | .09190 | 6.08320 |
| .599 | 4.170 | .52910 | .08040 | 6.58000 |
| .599 | 8.240 | .53090 | .07790 | 6.81800 |
| | GRADIENT | -.00134 | .00017 | -.03172 |

ALPHA = 10.000 ELEVON = .000
 RUDDER = -10.000 RUDDER = .000

PARAMETRIC DATA

RUN NO. 138/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/D |
|------|----------|---------|---------|---------|
| .900 | -8.160 | .54350 | .13960 | 3.89500 |
| .900 | -4.040 | .55980 | .14660 | 3.81900 |
| .900 | .090 | .55520 | .14950 | 3.71500 |
| .900 | 4.200 | .55060 | .14530 | 3.79000 |
| .900 | 8.330 | .54000 | .14000 | 3.89800 |
| | GRADIENT | -.00112 | -.00016 | -.00354 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

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AMES 11-7017 0A12 02A

(ASPO10) (27 MAY 73)

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0000 SCALE

ALPHA = 15.000 ELEVON = .000
RUDDER = -10.000 RUFLR = .000

PARAMETRIC DATA

RUN NO. 134/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|---------|
| .601 | -8.040 | .75580 | .19140 | 3.94900 |
| .601 | -3.980 | .76000 | .20280 | 3.74700 |
| .601 | .080 | .76060 | .20600 | 3.69200 |
| .601 | 4.170 | .76540 | .20490 | 3.73500 |
| .601 | 8.250 | .76110 | .19760 | 3.65100 |
| | GRADIENT | .00066 | .00026 | -.00146 |

RUN NO. 139/ 0 RV/L = 4.30 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .902 | -8.130 | .76650 | .20560 | 3.10800 |
| .902 | -4.020 | .76870 | .25010 | 3.07300 |
| .902 | .080 | .76170 | .25370 | 3.00200 |
| .902 | 4.200 | .75970 | .24910 | 3.04900 |
| .902 | 8.330 | .75770 | .24530 | 3.08800 |
| | GRADIENT | -.00109 | -.00012 | -.00291 |

(ABP011) (07 MAY 73)

TABULATED SOURCE FORCE DATA-QA12A

ANES 11-707 OA12 O2A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
RUDDER = -10.000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0000 SCALE

RUN NO. 135/ 0 RN/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .598 | -7.990 | 1.02300 | .36430 | 2.80600 |
| .598 | -3.960 | 1.02300 | .36820 | 2.77900 |
| .598 | .090 | 1.01300 | .37190 | 2.72500 |
| .598 | 4.190 | .99820 | .36050 | 2.76900 |
| .598 | 8.310 | .99860 | .35340 | 2.82600 |
| | GRADIENT | -.00304 | -.00095 | -.00120 |

RUN NO. 140/ 0 RN/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|---------|
| .901 | -8.060 | .95540 | .38200 | 2.50100 |
| .901 | -3.980 | .96780 | .39190 | 2.46900 |
| .901 | .090 | .96980 | .40240 | 2.41000 |
| .901 | 4.230 | .95770 | .39440 | 2.42800 |
| .901 | 8.360 | .95030 | .38850 | 2.44600 |
| | GRADIENT | -.00124 | .00030 | -.00497 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

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(ABP012) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

ALPHA = .000 ELEVON = .000
 RUDDER = -20.000 RUDDFLR = .000

PARAMETRIC DATA

RUN NO. 141/ 0 RM/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .599 | -7.970 | .03370 | .02020 | 1.66700 |
| .599 | -3.930 | .02460 | .02530 | .97010 |
| .599 | .100 | .01360 | .02960 | .46120 |
| .599 | 4.210 | .01510 | .02470 | .61150 |
| .599 | 8.330 | .02520 | .01610 | 1.55800 |
| | GRADIENT | -.00116 | -.00008 | -.04379 |

RUN NO. 146/ 0 RM/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .901 | -8.050 | .02870 | .03840 | .74690 |
| .901 | -4.000 | .03900 | .04210 | .92480 |
| .901 | .100 | .03660 | .04590 | .79600 |
| .901 | 4.280 | .03080 | .04370 | .70430 |
| .901 | 8.450 | .01650 | .03860 | .42900 |
| | GRADIENT | -.00099 | .00019 | -.02662 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

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(ABP013) (07 MAY 73)

ANES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0000 SCALE

XGRP = 32.3000 IN.
 YGRP = .0000 IN.
 ZGRP = .0000 IN.

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = .000
 RUDDER = -20.000 RUDDER = .000

RUN NO. 142/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .600 | -8.030 | .27370 | .03200 | 8.55700 |
| .600 | -3.970 | .27440 | .03970 | 7.09200 |
| .600 | .100 | .26700 | .04100 | 6.51500 |
| .600 | 4.180 | .26450 | .03730 | 7.09600 |
| .600 | 8.270 | .26980 | .03110 | 8.65700 |
| | GRADIENT | -.00121 | -.00017 | .00055 |

RUN NO. 147/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .902 | -8.140 | .29360 | .06520 | 4.50300 |
| .902 | -4.020 | .30290 | .06730 | 4.50000 |
| .902 | .100 | .30130 | .07380 | 4.58000 |
| .902 | 4.230 | .29350 | .06870 | 4.27200 |
| .902 | 8.380 | .27960 | .06370 | 4.38700 |
| | GRADIENT | -.00114 | .00017 | -.02761 |

DATE 13 SEP 73 TADULATED SOURCE FORCE DATA-0A12A

(ABP014) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 98.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

ALPHA = 10.000 ELEVON = .000
RUDDER = -80.000 RUOFLR = .000

PARAMETRIC DATA

RUN NO. 143/ 0 RM/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .599 | -8.060 | .55090 | .08110 | 6.79300 |
| .599 | -3.980 | .55440 | .08900 | 6.22800 |
| .599 | .090 | .54650 | .09430 | 5.79700 |
| .599 | 4.170 | .54430 | .09040 | 6.02200 |
| .599 | 8.250 | .54160 | .08430 | 6.42300 |
| | GRADIENT | -.00124 | .00017 | -.02324 |

RUN NO. 148/ 0 RM/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .906 | -8.150 | .54710 | .14180 | 3.85900 |
| .906 | -4.040 | .55420 | .14780 | 3.74900 |
| .906 | .090 | .55440 | .15380 | 3.60200 |
| .906 | 4.210 | .54850 | .15110 | 3.63100 |
| .906 | 8.350 | .53590 | .14330 | 3.74000 |
| | GRADIENT | -.00069 | .00040 | -.01431 |

(ABP015) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0412A

AMES 11-707 0412 OEA

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
RUDDER = -20.000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 144/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .600 | -8.040 | .75670 | .19780 | 3.82500 |
| .600 | -3.970 | .76200 | .20830 | 3.65800 |
| .600 | .100 | .75770 | .21070 | 3.59700 |
| .600 | 4.180 | .74590 | .20070 | 3.71700 |
| .600 | 8.260 | .74910 | .19420 | 3.85700 |
| | GRADIENT | -.00198 | -.00093 | .00725 |

RUN NO. 149/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .901 | -8.120 | .75720 | .24190 | 3.13000 |
| .901 | -4.010 | .77200 | .25790 | 3.02800 |
| .901 | .090 | .75900 | .25340 | 2.99100 |
| .901 | 4.210 | .75100 | .25180 | 2.98300 |
| .901 | 8.340 | .74300 | .24190 | 3.07100 |
| | GRADIENT | -.00255 | -.00038 | -.00547 |

(ABP016) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0412A

AMES 11-707 0412 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
RUDDER = -20.000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 145/ 0 RM/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .604 | -7.990 | 1.02100 | .36680 | 2.78400 |
| .604 | -3.990 | 1.02200 | .37460 | 2.72900 |
| .604 | .100 | 1.01500 | .37900 | 2.67800 |
| .604 | 4.200 | 1.01100 | .37190 | 2.71800 |
| .604 | 8.320 | .99170 | .35740 | 2.77500 |
| | GRADIENT | -.00135 | -.00033 | -.00133 |

RUN NO. 150/ 0 RM/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .899 | -8.060 | .95140 | .38360 | 2.48000 |
| .899 | -3.990 | .96080 | .39330 | 2.44300 |
| .899 | .090 | .97020 | .40750 | 2.38100 |
| .899 | 4.240 | .95640 | .39960 | 2.39400 |
| .899 | 8.370 | .93940 | .38620 | 2.43300 |
| | GRADIENT | -.00054 | .00076 | -.00593 |

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = .000 ELEVON = 10.000
RUDDER = .000 RUOFLR = .000

REFERENCE DATA

SREF = 2.4210 59.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 151/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|----------|
| .597 | -10.000 | .23340 | .02230 | 10.46000 |
| .597 | .080 | .22790 | .03600 | 6.33300 |
| .597 | 10.370 | .22710 | .02090 | 10.86000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 156/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|--------|--------|---------|
| .901 | -10.120 | .18630 | .04640 | 4.01600 |
| .901 | .080 | .18660 | .03550 | 3.36000 |
| .901 | 10.490 | .18170 | .04630 | 3.92600 |
| | GRADIENT | .00000 | .00000 | .00000 |

(ABP018) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = 10.000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREF = 2.4210 90.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 152/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|--------|--------|---------|
| .598 | -10.070 | .47930 | .05370 | 8.92700 |
| .598 | .080 | .48220 | .06570 | 7.33800 |
| .598 | 10.300 | .47670 | .05240 | 9.09600 |
| | GRADIENT | .03000 | .07000 | .00000 |

RUN NO. 160/ 0 RV/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|--------|--------|---------|
| .895 | -10.190 | .46490 | .08720 | 5.33200 |
| .895 | .080 | .47890 | .09640 | 4.96500 |
| .895 | 10.420 | .46380 | .08750 | 5.29700 |
| | GRADIENT | .03000 | .00000 | .00000 |

(ABP019) (07 MAY 73)

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = 10.000
RUDDER = .000 RUDDFLR = .000

TABULATED SOURCE FORCE DATA-0A12A

ANES 11-707 0A12 02A

REFERENCE DATA

SMRP = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LMRP = 39.8490 IN. YMRP = .0000 IN.
BMRP = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 153/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/D |
|------|----------|--------|--------|---------|
| .599 | -10.110 | .73290 | .13000 | 5.79200 |
| .599 | .090 | .76890 | .14440 | 5.32000 |
| .599 | 10.270 | .75160 | .12910 | 5.82000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 157/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/D |
|------|----------|--------|--------|---------|
| .897 | -10.210 | .72410 | .18770 | 3.65800 |
| .897 | .090 | .74460 | .20010 | 3.72100 |
| .897 | 10.390 | .73150 | .19230 | 3.80400 |
| | GRADIENT | .00000 | .00000 | .00000 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

AWES 11-707 0A12 02A

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(ABP020) (07 MAY 73)

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = 10.000
RUDDER = .000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.6490 IN. YMRP = .0000 IN.
BREF = 39.6490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 154/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|---------|
| .599 | -10.080 | .92620 | .29720 | 3.60100 |
| .599 | .080 | .93230 | .27380 | 3.40500 |
| .599 | 10.290 | .92340 | .25300 | 3.65000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 159/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|---------|
| .902 | -10.190 | .91950 | .30310 | 3.03400 |
| .902 | .070 | .92760 | .32010 | 2.89700 |
| .902 | 10.380 | .91600 | .30770 | 2.97600 |
| | GRADIENT | .00000 | .00000 | .00000 |

TABULATED SOURCE FORCE DATA-0A12A

(ABP021) (57 MAY 75)

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = 10.000
RUDDER = .000 RUCFLR = .500

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 195/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|--------|---------|
| .600 | -10.030 | 1.17200 | .43590 | 2.69000 |
| .600 | .070 | 1.16100 | .44280 | 2.62200 |
| .600 | 10.370 | 1.15700 | .42890 | 2.69800 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 158/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|--------|---------|
| .901 | -10.100 | 1.06500 | .43960 | 2.42200 |
| .901 | .080 | 1.09000 | .45940 | 2.35100 |
| .901 | 10.420 | 1.05700 | .44460 | 2.37700 |
| | GRADIENT | .00000 | .00000 | .00000 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0412A

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JANF022) 1 07 MAY 73)

AMES 11-707 0412 02A

REFERENCE DATA

SREF = 2.4210 50.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .03000 SCALE

XREF = 32.3000 IN.
YREF = .0000 IN.
ZREF = .0000 IN.

PARAMETRIC DATA

ALPHA = .000 ELEVON = -10.000
ROTOR = .000 FLUTER = .000

RUN NO. 161/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/CF |
|------|----------|---------|---------|-----------|
| .597 | -7.970 | -.16060 | .01640 | -9.78900 |
| .597 | -3.940 | -.16130 | .02230 | -7.24100 |
| .597 | .080 | -.17070 | .02300 | -6.83400 |
| .597 | 4.200 | -.17410 | .02160 | -8.57700 |
| .597 | 8.300 | -.16750 | .01450 | -11.59000 |
| | GRADIENT | -.00157 | -.00009 | -1.0353 |

RUN NO. 166/ 0 RV/L = 4.53 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/CF |
|------|----------|---------|---------|----------|
| .904 | -8.090 | -.12640 | .04900 | -2.81100 |
| .904 | -4.000 | -.12640 | .04720 | -2.67800 |
| .904 | .080 | -.14320 | .04960 | -2.68800 |
| .904 | 4.250 | -.14150 | .04900 | -3.14600 |
| .904 | 8.410 | -.13670 | .04210 | -3.25000 |
| | GRADIENT | -.00182 | -.00027 | -.05699 |

(ASPC23) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = -15.000
RUDDER = .000 RUFLR = .000

REFERENCE DATA

SREF = 2.4210 90.FT.
LREF = 39.6490 IN.
BREF = 39.6490 IN.
SCALE = .0000 SCALE

RUN NO. 162/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .598 | -8.030 | .06590 | .01260 | 5.10400 |
| .598 | -3.970 | .06200 | .01810 | 3.43100 |
| .598 | .080 | .04980 | .02000 | 2.69200 |
| .598 | 4.170 | .03030 | .01750 | 2.89100 |
| .598 | 6.250 | .03250 | .01320 | 3.96900 |
| | GRADIENT | -.00141 | -.00007 | -.06807 |

RUN NO. 157/ 0 RV/L = 4.46 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .901 | -8.140 | .17470 | .05490 | 3.20600 |
| .901 | -4.030 | .18180 | .05980 | 3.04100 |
| .901 | .090 | .17780 | .06230 | 2.85400 |
| .901 | 4.220 | .18050 | .05910 | 3.03500 |
| .981 | 8.350 | .18700 | .05520 | 3.02200 |
| | GRADIENT | -.00016 | -.00009 | .00172 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(ASPT24) (07 MAY 73)

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -10.000
RUDDER = .000 RUCFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 169/ 0 RV/L = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|---------|
| .599 | -8.080 | .33450 | .04040 | 8.28300 |
| .599 | -3.990 | .32940 | .04550 | 7.27100 |
| .599 | .080 | .32090 | .04830 | 6.64100 |
| .599 | 4.190 | .32310 | .04790 | 6.73900 |
| .599 | 8.230 | .32140 | .04390 | 7.31500 |
| | GRADIENT | -.00077 | .00032 | -.06536 |

RUN NO. 168/ 0 RV/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .900 | -8.190 | .44140 | .12520 | 3.52500 |
| .900 | -4.090 | .44590 | .13180 | 3.38300 |
| .900 | .080 | .43960 | .13410 | 3.27700 |
| .900 | 4.190 | .43820 | .13070 | 3.35300 |
| .900 | 8.330 | .43020 | .12670 | 3.39500 |
| | GRADIENT | -.00094 | -.00013 | -.00365 |

(ABP025) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AWES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = -10.000
RUDDER = .000 RUDDFLR = .000

REF: J.E. DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 164/ 0 RN/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .598 | -6.040 | .58080 | .14203 | 4.08800 |
| .598 | -3.990 | .58320 | .15180 | 3.84200 |
| .598 | .080 | .57210 | .15010 | 3.61100 |
| .598 | 4.160 | .57790 | .14770 | 3.86300 |
| .598 | 6.230 | .57030 | .14030 | 4.06400 |
| | GRADIENT | -.00156 | -.00050 | .00258 |

RUN NO. 169/ 0 RN/L = 4.46 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|---------|
| .899 | -6.130 | .62760 | .22080 | 2.84300 |
| .899 | -4.020 | .62900 | .22570 | 2.78700 |
| .899 | .080 | .63010 | .23020 | 2.73800 |
| .899 | 4.190 | .61790 | .22240 | 2.77800 |
| .899 | 6.330 | .61770 | .22060 | 2.80000 |
| | GRADIENT | -.00135 | -.00040 | -.00109 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(ASPO26) (07 MAY 73)

AKES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

XMRP = 32.3000 IN.
YMRP = .0000 IN.
ZMRP = .0000 IN.

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -10.000
RUDDER = .000 RUOFLR = .000

RUN NO. 165/ 0 RNVL = 3.96 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .599 | -7.980 | .84680 | .29470 | 2.87400 |
| .599 | -3.960 | .84480 | .29940 | 2.82200 |
| .599 | .070 | .83590 | .30030 | 2.78400 |
| .599 | 4.190 | .82910 | .29510 | 2.81000 |
| .599 | 8.300 | .82670 | .29040 | 2.84700 |
| | GRADIENT | -.00193 | -.00253 | -.00144 |

RUN NO. 170/ 0 RNVL = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .904 | -8.070 | .80600 | .33660 | 2.39400 |
| .904 | -3.990 | .81600 | .34610 | 2.35800 |
| .904 | .080 | .81970 | .35260 | 2.32400 |
| .904 | 4.230 | .80770 | .34670 | 2.33000 |
| .904 | 8.360 | .80300 | .34200 | 2.34800 |
| | GRADIENT | -.00102 | .00207 | -.00339 |

(ABP027) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = -20.000
RUDDER = .000 RUDDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.6490 IN. YREF = .0000 IN.
BREF = 39.6490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 171/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|---------|--------|----------|
| .600 | -4.910 | -.46140 | .07130 | -6.43100 |
| .600 | .080 | -.48290 | .07630 | -6.31200 |
| .600 | 5.260 | -.48300 | .07240 | -6.66800 |
| | GRADIENT | -.00431 | .00100 | .02786 |

RUN NO. 182/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF |
|------|----------|---------|--------|----------|
| .899 | -4.980 | -.49530 | .10670 | -4.64400 |
| .899 | .080 | -.51020 | .11390 | -4.50500 |
| .899 | 5.330 | -.50830 | .10520 | -4.83200 |
| | GRADIENT | -.00294 | .00130 | .02747 |

TABULATED SOURCE FORCE DATA-0A12A

DATE 13 SEP 73

(ABP020) (07 MAY 73)

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = .000 ELEVON = -20.000
RUDDER = .000 RUOFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
ZREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 172/ 0 RN/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .598 | -7.970 | -.27400 | .04000 | -6.85100 |
| .598 | -3.940 | -.27970 | .04730 | -5.91300 |
| .598 | .090 | -.29050 | .04970 | -5.84900 |
| .598 | 4.190 | -.29090 | .04910 | -6.04400 |
| .598 | 8.290 | -.28440 | .04370 | -6.50200 |
| | GRADIENT | -.00137 | .00010 | -.01620 |

RUN NO. 161/ 0 RN/L = 4.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|---------|----------|
| .900 | -8.080 | -.25970 | .06780 | -3.83200 |
| .900 | -4.000 | -.26660 | .07470 | -3.56900 |
| .900 | .080 | -.27700 | .07780 | -3.56000 |
| .900 | 4.240 | -.27270 | .07440 | -3.66500 |
| .900 | 8.400 | -.26430 | .06740 | -3.92500 |
| | GRADIENT | -.00073 | -.00004 | -.01159 |

(ABP029) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 73

REFERENCE DATA

XREF = 2.4210 SQ.FT.
 YREF = 39.6450 IN.
 ZREF = 39.6450 IN.
 SCALE = .0300 SCALE
 XMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = -20.000
 RUDDER = .000 RUDFLR = .000

RUN NO. 173/ 0 RM/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .600 | -8.030 | -.03280 | .02680 | -1.96300 |
| .600 | -3.980 | -.04830 | .03390 | -1.43300 |
| .600 | .080 | -.06660 | .03660 | -1.81900 |
| .600 | 4.160 | -.06500 | .03570 | -1.82100 |
| .600 | 8.250 | -.09930 | .03190 | -1.86100 |
| | GRADIENT | -.02203 | .00023 | -.04763 |

RUN NO. 180/ 0 RM/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|---------|
| .896 | -8.130 | .04340 | .06150 | .70510 |
| .896 | -4.020 | .04460 | .06830 | .65220 |
| .896 | .080 | .03090 | .06900 | .44800 |
| .896 | 4.210 | .03070 | .06930 | .44340 |
| .896 | 8.340 | .03220 | .06320 | .50950 |
| | GRADIENT | -.00169 | .00012 | -.02534 |

DATE 13 SEP 73
TABULATED SOURCE FORCE DATA-QA12A
AMES 11-707 OA12 O2A

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -20.000
RUDDER = .000 RUDEFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 174/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/DF |
|------|----------|---------|--------|---------|
| .598 | -8.050 | .19410 | .03940 | 4.92200 |
| .598 | -3.980 | .19560 | .04710 | 4.15233 |
| .598 | .080 | .18850 | .05040 | 3.74400 |
| .598 | 4.150 | .18790 | .04910 | 3.82600 |
| .598 | 8.230 | .19020 | .04730 | 4.01900 |
| | GRADIENT | -.00095 | .00025 | -.04007 |

RUN NO. 179/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/DF |
|------|----------|---------|---------|---------|
| .903 | -8.160 | .39530 | .12930 | 3.05800 |
| .903 | -4.040 | .40690 | .13900 | 2.92700 |
| .903 | .080 | .39860 | .14110 | 2.82500 |
| .903 | 4.190 | .39380 | .13690 | 2.87700 |
| .903 | 8.320 | .38390 | .13040 | 2.94300 |
| | GRADIENT | -.00159 | -.00025 | -.00608 |

(ASPO31) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = -20.000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.6490 IN. YMRP = .0000 IN.
BREF = 39.6490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 175/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .600 | -8.040 | .44910 | .12470 | 3.60300 |
| .600 | -3.980 | .44130 | .13290 | 3.32100 |
| .600 | .080 | .42880 | .13270 | 3.23200 |
| .600 | 4.170 | .42030 | .12440 | 3.37900 |
| .600 | 8.240 | .43170 | .12290 | 3.51200 |
| | GRADIENT | -.00258 | -.00104 | .00715 |

RUN NO. 176/ 0 RV/L = 4.48 GRADIENT INTER /AL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .898 | -8.130 | .59250 | .22530 | 2.63000 |
| .898 | -4.020 | .58200 | .22950 | 2.53600 |
| .898 | .080 | .57590 | .22750 | 2.53100 |
| .898 | 4.200 | .58170 | .22630 | 2.57100 |
| .898 | 8.330 | .58520 | .22100 | 2.64800 |
| | GRADIENT | -.00004 | -.00039 | .00426 |

DATE 13 SEP 73
TABULATED SOURCE FORCE DATA-0A12A
AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -20.000
RUDDER = .000 RUDFLR = .000

RUN NO. 176/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .600 | -7.980 | .68010 | .25780 | 2.63800 |
| .600 | -3.990 | .68780 | .26820 | 2.56500 |
| .600 | .070 | .68160 | .27170 | 2.50900 |
| .600 | 4.190 | .67030 | .26200 | 2.55800 |
| .600 | 8.290 | .65760 | .25010 | 2.62900 |
| | GRADIENT | -.00215 | -.00077 | -.00081 |

RUN NO. 177/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|---------|
| .902 | -8.070 | .76800 | .34180 | 2.24700 |
| .902 | -4.000 | .75800 | .34580 | 2.19200 |
| .902 | .070 | .75000 | .34890 | 2.15000 |
| .902 | 4.220 | .75110 | .34750 | 2.16100 |
| .902 | 8.360 | .76670 | .34560 | 2.21800 |
| | GRADIENT | -.00084 | .00021 | -.00375 |

(ASPOSS) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = .000 RUDDFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 183/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/DF |
|------|----------|---------|--------|----------|
| .598 | -4.910 | -.17690 | .04690 | -3.80600 |
| .598 | .080 | -.19900 | .05060 | -3.85600 |
| .598 | 5.280 | -.19300 | .04400 | -4.38900 |
| | GRADIENT | -.00363 | .00082 | -.01002 |

RUN NO. 189/ 0 RV/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/DF |
|------|----------|---------|--------|----------|
| .899 | -4.990 | -.21480 | .06180 | -3.47400 |
| .899 | .080 | -.23250 | .06680 | -3.48900 |
| .899 | 5.390 | -.22960 | .06190 | -3.71000 |
| | GRADIENT | -.00357 | .00099 | -.00217 |

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

XMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

PARAMETRIC DATA

ALPHA = .000 ELEVON = .500
 RUDDER = .000 RUDDFLR = 40.000

RUN NO. 184/ 0 RN/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .559 | -7.950 | .00770 | .03440 | .22450 |
| .599 | -3.950 | .00370 | .04130 | .09020 |
| .599 | .090 | -.01040 | .04520 | -.23020 |
| .599 | 4.200 | -.00880 | .04040 | -.21830 |
| .599 | 8.310 | -.00210 | .03320 | -.06230 |
| | GRADIENT | -.00153 | -.00011 | -.03774 |

RUN NO. 190/ 0 RN/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .901 | -8.100 | .01010 | .05310 | .16940 |
| .901 | -4.010 | .01760 | .05570 | .31610 |
| .901 | .080 | .00510 | .05850 | .08670 |
| .901 | 4.250 | .00530 | .05450 | .09740 |
| .901 | 8.430 | .00100 | .05030 | .01910 |
| | GRADIENT | -.00148 | -.00015 | -.02638 |

DATE 13 SEP 73

(ASPO35) (07 MAY 73)

AWES 11-707 0A12 02A

PARAMETRIC DATA

ALPHA = 5.000 ELEVON = .000
RUDDER = .000 RUFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 185/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .598 | -8.040 | .24490 | .04770 | 9.13400 |
| .598 | -3.980 | .24680 | .05310 | 4.64900 |
| .598 | .080 | .23090 | .05670 | 4.07790 |
| .598 | 4.170 | .23220 | .05290 | 4.39100 |
| .598 | 8.260 | .23340 | .04590 | 5.08100 |
| | GRADIENT | -.00179 | -.00003 | -.03152 |

RUN NO. 191/ 0 RV/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|---------|---------|
| .903 | -1.160 | .27420 | .07740 | 3.54100 |
| .903 | -4.040 | .28120 | .07960 | 3.53300 |
| .903 | .080 | .27130 | .06180 | 3.31800 |
| .903 | 4.220 | .27000 | .07820 | 3.45200 |
| .903 | 8.370 | .25620 | .07480 | 3.42800 |
| | GRADIENT | -.00179 | -.00017 | -.00977 |

DATE 13 SEP 79

TABULATED SOURCE FORCE DATA-0A12A

PAGE 24

AVES 11-707 0A12 02A

ADP-736 1 07 MAY 79

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

XMRP = 32.3000 IN.
YMRP = .0000 IN.
ZMRP = .0000 IN.

PARAMETRIC DATA

ALPHA = 18.000
BUTER = .000
ELEVON = .000
SUPER = .000

RUN NO. 186/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|--------|---------|
| .599 | -8.070 | .50610 | .08890 | 5.69100 |
| .599 | -3.990 | .50380 | .09820 | 5.29000 |
| .599 | .080 | .51380 | .10570 | 4.95500 |
| .599 | 4.160 | .50060 | .09810 | 5.10500 |
| .599 | 8.230 | .49950 | .09170 | 5.44500 |
| | GRADIENT | -.00101 | .00023 | -.02257 |

RUN NO. 192/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|--------|---------|
| .902 | -8.170 | .52910 | .19270 | 3.46600 |
| .902 | -4.050 | .53540 | .15790 | 3.40400 |
| .902 | .080 | .52920 | .16280 | 3.25500 |
| .902 | 4.200 | .52530 | .15910 | 3.30200 |
| .902 | 8.330 | .51880 | .15330 | 3.39400 |
| | GRADIENT | -.00122 | .00022 | -.01237 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0412A

PAGE 83

(ADPES7) (07 MAY 73)

AMES 11-707 0412 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XGRP = 32.3000 IN.
 LREF = 39.8490 IN. YGRP = .0000 IN.
 BREF = 39.8490 IN. ZGRP = .0000 IN.
 SCALE = .0300 IN/IN

RUN NO. 187/ 0 RV/L = 3.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|---------|---------|
| .596 | -8.050 | .74050 | .20690 | 3.54400 |
| .596 | -3.990 | .73550 | .21720 | 3.39600 |
| .596 | .080 | .72680 | .21620 | 3.36100 |
| .596 | 4.160 | .72790 | .21460 | 3.39220 |
| .596 | 8.250 | .72890 | .20570 | 3.54300 |
| | GRADIENT | -.00093 | -.00032 | .00074 |

RUN NO. 193/ 0 RV/L = 4.48 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|---------|---------|
| .899 | -8.150 | .74540 | .23700 | 2.90100 |
| .899 | -4.030 | .74790 | .26300 | 2.84400 |
| .899 | .070 | .73600 | .26160 | 2.82200 |
| .899 | 4.200 | .73470 | .25950 | 2.83200 |
| .899 | 8.330 | .72480 | .25290 | 2.86600 |
| | GRADIENT | -.00160 | -.00043 | -.00145 |

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
 RUDDER = .000 RUDDLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.6490 IN.
 BREF = 39.6490 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA
 ALPHA = 25.000 ELEVON = .000
 RUDDER = .000 SUPER = 40.000

RUN NO. 188/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|--------|---------|
| .598 | -8.000 | .99600 | .37540 | 2.55300 |
| .598 | -3.960 | .99480 | .37870 | 2.52700 |
| .598 | .000 | .99130 | .38260 | 2.59100 |
| .598 | 4.190 | .98910 | .37970 | 2.59500 |
| .598 | 8.300 | .97680 | .37020 | 2.63800 |
| | GRADIENT | -.00119 | .00012 | -.00391 |

RUN NO. 194/ 0 RV/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF |
|------|----------|---------|---------|---------|
| .699 | -8.080 | .93170 | .39180 | 2.37800 |
| .699 | -3.990 | .94420 | .40010 | 2.34200 |
| .699 | .060 | .93740 | .40700 | 2.30400 |
| .699 | 4.220 | .92390 | .39870 | 2.31700 |
| .699 | 8.360 | .92680 | .39480 | 2.34700 |
| | GRADIENT | -.00247 | -.00054 | -.00303 |

DATE 13 SEP 73

TABULATED SOURCE FORCE DATA-0A12A

(ABP039) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

YMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

PARAMETRIC DATA

BETA = .000 ELEVON = .000
 RUDDER = .000 RUDFLR = .000

RUN NO. 199/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/D |
|-------|----------|---------|--------|----------|
| 1.099 | -4.590 | -.22090 | .09380 | -2.35600 |
| 1.099 | -3.520 | -.16230 | .08840 | -1.83500 |
| 1.099 | -1.490 | -.04350 | .08170 | -.53220 |
| 1.099 | .540 | .08610 | .08390 | 1.02600 |
| 1.099 | 2.510 | .21090 | .09410 | 2.24200 |
| 1.099 | 4.050 | .30120 | .10700 | 2.81600 |
| 1.099 | 6.630 | .44750 | .13640 | 3.28000 |
| 1.099 | 8.590 | .55040 | .16530 | 3.32900 |
| 1.099 | 9.970 | .62130 | .19100 | 3.25400 |
| 1.099 | 14.970 | .86200 | .31300 | 2.75400 |
| | GRADIENT | .06121 | .00140 | .63031 |

RUN NO. 197/ 0 RV/L = 2.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/D |
|-------|----------|---------|--------|----------|
| 1.247 | -4.440 | -.19670 | .09710 | -2.02600 |
| 1.247 | -3.470 | -.13910 | .09200 | -1.51200 |
| 1.247 | -1.470 | -.02380 | .08780 | -.27110 |
| 1.247 | .520 | .09440 | .09040 | 1.04400 |
| 1.247 | 2.580 | .20740 | .09930 | 2.08900 |
| 1.247 | 4.570 | .31320 | .11410 | 2.74500 |
| 1.247 | 6.670 | .42410 | .13710 | 3.09300 |
| 1.247 | 8.660 | .52900 | .16720 | 3.16400 |
| 1.247 | 10.030 | .59980 | .19180 | 3.12800 |
| 1.247 | 14.980 | .84280 | .31120 | 2.70900 |
| | GRADIENT | .05681 | .00181 | .55042 |

RUN NO. 195/ 0 RV/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/D |
|-------|----------|---------|--------|----------|
| 1.398 | -4.420 | -.17370 | .10100 | -1.72000 |
| 1.398 | -3.420 | -.12240 | .09660 | -1.26700 |
| 1.398 | -1.430 | -.01730 | .09170 | -.18840 |
| 1.398 | .520 | .08310 | .09350 | .88880 |
| 1.398 | 2.600 | .18660 | .10150 | 1.83900 |
| 1.398 | 4.570 | .28230 | .11400 | 2.47600 |
| 1.398 | 6.440 | .37290 | .13190 | 2.82800 |
| 1.398 | 8.710 | .48010 | .16120 | 2.97800 |
| 1.398 | 10.110 | .55250 | .18670 | 2.96000 |
| 1.398 | 15.030 | .78400 | .29710 | 2.63900 |
| | GRADIENT | .05088 | .00137 | .48206 |

DATE 13 SEP 73
TABULATED SOURCE FORCE DATA-0A12A
ANES 11-707 0A12 02A

REFERENCE DATA

SRF = 2.4210 S3.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = .500
RUDDER = .000
ELEVON = .000
RUGFLR = .000

RUN NO. 200/ 0 RV/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|-------|----------|---------|--------|---------|
| 1.099 | -8.080 | .09470 | .07680 | 1.23200 |
| 1.099 | -4.000 | .08840 | .08150 | 1.08500 |
| 1.099 | -1.960 | .08870 | .08320 | 1.06500 |
| 1.099 | .080 | .08170 | .08340 | .97870 |
| 1.099 | 2.150 | .08250 | .08330 | .98940 |
| 1.099 | 4.230 | .08090 | .08260 | .97940 |
| 1.099 | 8.390 | .08180 | .07910 | 1.03400 |
| | GRADIENT | -.00103 | .00011 | -.01391 |

RUN NO. 198/ 0 RV/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|-------|----------|---------|--------|---------|
| 1.250 | -8.040 | .09230 | .08370 | 1.10200 |
| 1.250 | -3.970 | .09850 | .08730 | 1.12800 |
| 1.250 | -1.940 | .09550 | .08910 | 1.07200 |
| 1.250 | .080 | .09340 | .08990 | 1.03900 |
| 1.250 | 2.140 | .09170 | .09030 | 1.01600 |
| 1.250 | 4.210 | .08590 | .08940 | .96030 |
| 1.250 | 8.340 | .07610 | .08600 | .88540 |
| | GRADIENT | -.00142 | .00026 | -.01915 |

RUN NO. 196/ 0 RV/L = 2.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|-------|----------|---------|--------|---------|
| 1.396 | -8.040 | .07010 | .08890 | .78780 |
| 1.396 | -3.970 | .07240 | .09110 | .79440 |
| 1.396 | .080 | .06870 | .09310 | .73770 |
| 1.396 | 4.210 | .06550 | .09360 | .70020 |
| 1.396 | 8.360 | .05810 | .09060 | .64170 |
| | GRADIENT | -.00084 | .00031 | -.01151 |

(ABP041) (07 MAY 73)

DATE 13 SEP 72
TABULATED SOURCE FORCE DATA-0412A
AMES 11-707 0412 OEA

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = -10.000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 201/ 0 RV/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|----------|
| .600 | -4.910 | -.14610 | .02080 | -7.01600 |
| .600 | .090 | -.16150 | .02630 | -5.69700 |
| .600 | 5.280 | -.15750 | .02080 | -7.58300 |
| | GRADIENT | -.00308 | .00150 | .26380 |

RUN NO. 202/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|---------|--------|----------|
| .901 | -4.990 | -.17990 | .04290 | -4.19300 |
| .901 | .090 | -.18560 | .04650 | -3.99400 |
| .901 | 5.360 | -.19150 | .04150 | -4.61600 |
| | GRADIENT | -.00112 | .00071 | .03917 |

(ABP042) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0412A

ANES 11-707 0412 02A

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = .000
RUDDER = -20.000 RUOFLR = .000

REFERENCE DATA

SREF = 2.1210 59. FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .0300 SCALE

RUN NO. 203/ 0 RN/L = 3.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/DF |
|------|----------|---------|--------|----------|
| .596 | -4.900 | -.15310 | .02900 | -5.28400 |
| .596 | .100 | -.16720 | .03440 | -4.85900 |
| .596 | 5.290 | -.16370 | .02700 | -6.06100 |
| | GRADIENT | -.00282 | .03108 | .08500 |

RUN NO. 204/ 0 RN/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CTF | L/DF |
|------|----------|---------|--------|----------|
| .901 | -4.980 | -.17980 | .04660 | -3.85900 |
| .901 | .100 | -.19300 | .05110 | -3.77500 |
| .901 | 5.360 | -.19790 | .04840 | -4.09000 |
| | GRADIENT | -.00260 | .00789 | .01654 |

TABULATED SOURCE FORCE DATA-0A12A

(ABP043) (07 MAY 73)

AMES 11-707 0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = 10.000
 RUDDER = .000 RUOFLR = .000

RUN NO. 205/ 0 RV/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|---------|
| .600 | -4.910 | .05630 | .02320 | 2.42500 |
| .600 | .080 | .04320 | .02800 | 1.54000 |
| .600 | 5.270 | .04220 | .02160 | 1.95200 |
| | GRADIENT | -.00263 | .00056 | -.17735 |

RUN NO. 206/ 0 RV/L = 4.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|---------|
| .903 | -4.980 | -.02530 | .04260 | -.59400 |
| .903 | .080 | -.04000 | .04970 | -.80510 |
| .903 | 5.340 | -.04370 | .04380 | -.99710 |
| | GRADIENT | -.00291 | .00140 | -.04172 |

(ABFD44) (07 MAY 75)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

DATE 13 SEP 73

PARAMETRIC DATA

ALPHA = -4.000 ELEVON = -10.000
RUDDER = .000 RUDFLR = .000

REFERENCE DATA

SREF = 2.4210 50.FT.
LREF = 39.6490 IN.
BREF = 39.6490 IN.
SCALE = .0300 SCALE

XMRP = 32.3000 IN.
YMRP = .0000 IN.
ZMRP = .0000 IN.

RUN NO. 207/ 0 RN/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .597 | -4.910 | -.35000 | .03970 | -8.81400 |
| .597 | .080 | -.36730 | .04340 | -8.47100 |
| .597 | 5.270 | -.36390 | .04000 | -9.10900 |
| | GRADIENT | -.00347 | .00074 | .06874 |

RUN NO. 208/ 0 RN/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .904 | -4.980 | -.35700 | .06700 | -5.32900 |
| .904 | .090 | -.37340 | .07170 | -5.20600 |
| .904 | 5.340 | -.37620 | .06720 | -5.60000 |
| | GRADIENT | -.00323 | .00093 | .02426 |

(ABP045) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A

PARAMETRIC DATA

A' PHA = -4.000 ELEVON = .000
RUDER = .000 RUDEFR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 210/ 0 RN/L = 3.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .598 | -4.910 | -.14850 | .01970 | -7.44000 |
| .598 | .090 | -.15860 | .02480 | -6.40200 |
| .598 | 5.280 | -.15750 | .01900 | -8.27900 |
| | GRADIENT | -.02242 | .00102 | .20760 |

RUN NO. 209/ 0 RN/L = 4.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF |
|------|----------|---------|--------|----------|
| .901 | -5.000 | -.17840 | .04210 | -4.24100 |
| .901 | .090 | -.18660 | .04440 | -4.19870 |
| .901 | 5.350 | -.19030 | .03940 | -4.83670 |
| | GRADIENT | -.00161 | .00045 | .00845 |

DATE 13 SEP 73 TABULATED SOURCE FORCE DATA-0A12A

(ABPD46) (07 MAY 73)

AMES 11-707 0A12 OEA INVERTED

PARAMETRIC DATA

8.7A = .000 ELEVON = .000
FLUDER = .000 RUOFLR = .000

REFERENCE DATA

SREF = 2.4210 50.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 216/ 0 RV/L = 4.02 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/DF |
|------|----------|--------|--------|--------|
| .599 | -15.850 | .00000 | .00000 | .00000 |
| .599 | -10.490 | .00000 | .00000 | .00000 |
| .599 | -5.200 | .00000 | .00000 | .00000 |
| .599 | .050 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 211/ 0 RV/L = 4.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | CL | CD | L/DF |
|------|----------|--------|--------|--------|
| .902 | -16.390 | .00000 | .00000 | .00000 |
| .902 | -10.840 | .00000 | .00000 | .00000 |
| .902 | -5.360 | .00000 | .00000 | .00000 |
| .902 | .060 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

(ABPD47) (07 MAY 73)

TABULATED SOURCE FORCE DATA-0A12A

AMES 11-707 0A12 02A INVERTED

PARAMETRIC DATA

ALPHA = -5.000 ELEVON = .000
RUDDER = .000 RUDDLR = .000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0500 SCALE

RUN NO. 215/ 0 RV/L = 4.01 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|--------|
| .598 | -10.300 | .00000 | .00000 | .00000 |
| .598 | -5.190 | .00000 | .00000 | .00000 |
| .598 | 5.000 | .00000 | .00000 | .00000 |
| .598 | 10.080 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 212/ 0 RV/L = 4.49 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D |
|------|----------|--------|--------|--------|
| .898 | -10.440 | .00000 | .00000 | .00000 |
| .898 | -5.270 | .00000 | .00000 | .00000 |
| .898 | 5.070 | .00000 | .00000 | .00000 |
| .898 | 10.220 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

(ABP048) (07 MAY 73)

TABULATED SOURCE FORCE DATA-OM12A

AMES 11-707 OM12 O2A INVERTED

PARAMETRIC DATA

ALPHA = -10.000 ELEVON = .000
RUDDER = .000 RUOFLR = .000

REFERENCE DATA

SREF = 2.4210 59.FT.
LREF = 39.6490 IN.
BREF = 39.6490 IN.
SCALE = .0300 SCALE

RUN NO. 214/ 0 RV/L = 4.00 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | C _D | L/D _F |
|------|----------|--------|----------------|------------------|
| .999 | -10.280 | .00000 | .00000 | .00000 |
| .999 | -5.180 | .00000 | .00000 | .00000 |
| .999 | 5.020 | .00000 | .00000 | .00000 |
| .999 | 10.120 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

RUN NO. 213/ 0 RV/L = 4.47 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | C _D | L/D _F |
|------|----------|--------|----------------|------------------|
| .901 | -10.460 | .00000 | .00000 | .00000 |
| .901 | -5.270 | .00000 | .00000 | .00000 |
| .901 | 5.110 | .00000 | .00000 | .00000 |
| .901 | 10.300 | .00000 | .00000 | .00000 |
| | GRADIENT | .00000 | .00000 | .00000 |

PARAMETRIC DATA

| | | | | | |
|---------|---|------|--------|---|--------|
| BETA | = | .000 | ELEVON | = | .000 |
| ELRUFER | = | .000 | RUCFLR | = | 40.000 |

CONFERENCE DATA

| | | | | | |
|---------|---------|--------|--------|---------|-----|
| SEF = | 2.4210 | 52.FT. | 106P = | 32.5000 | IN. |
| LEY = | 39.8490 | IN. | 146P = | .0000 | IN. |
| BEF = | 39.8490 | IN. | 246P = | .0000 | IN. |
| SCALE = | .0000 | SCALE | | | |

FIN NO. 290/0 RVL = 1.46 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | ALPHA | ON | CLM | CA | C ⁺ F | CBL | CYN | CY | CASO | CL | L/D ² |
|-------|--------|----------|----------|--------|------------------|---------|---------|--------|---------|---------|------------------|
| 2.498 | -0.095 | -0.00100 | -0.00310 | .12470 | .10490 | .00020 | -.00030 | .00120 | .00200 | -.00130 | -.01210 |
| 2.498 | 4.960 | .15200 | -0.01140 | .11950 | .09970 | .00010 | -.00040 | .00260 | .01970 | .14310 | 1.27200 |
| 2.498 | 9.970 | .31000 | -0.01640 | .11570 | .09370 | -.00010 | -.00040 | .00390 | .02190 | .28940 | 1.98200 |
| 2.498 | 14.890 | .46800 | -.02070 | .11360 | .08900 | -.00020 | -.00030 | .00560 | .02460 | .42300 | 2.12500 |
| 2.498 | 19.870 | .68400 | -.02390 | .10850 | .08510 | -.00040 | -.00070 | .00710 | .02340 | .61450 | 1.96500 |
| 2.498 | | | | | | | .00070 | .00028 | -.00010 | .02899 | .23429 |

| Variable | Mean | Std. Dev. | Std. Error | 95% Confidence Interval | 95% Prediction Interval |
|----------------------|------|-----------|------------|-------------------------|-------------------------|
| Dependent Variable | | | | | |
| Intercept | 1.00 | .00 | .00 | .00 | .00 |
| Independent Variable | | | | | |
| Variable 1 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 2 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 3 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 4 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 5 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 6 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 7 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 8 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 9 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 10 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 11 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 12 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 13 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 14 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 15 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 16 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 17 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 18 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 19 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 20 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 21 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 22 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 23 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 24 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 25 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 26 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 27 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 28 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 29 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 30 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 31 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 32 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 33 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 34 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 35 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 36 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 37 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 38 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 39 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 40 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 41 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 42 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 43 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 44 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 45 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 46 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 47 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 48 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 49 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 50 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 51 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 52 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 53 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 54 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 55 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 56 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 57 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 58 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 59 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 60 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 61 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 62 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 63 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 64 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 65 | 1.00 | .00 | .00 | .00 | .00 |
| Variable 66 | 1.00 | .00 | .00 | .00 | .00 |

[illegible]

DATE 26 SEP 75 TABULATED SOURCE FORCE DATA-0A12C

(RB3002) (26 MAY 75)

AMES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = .000 ELEVON = .000
RUDDER = .000 RUFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 289/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|----------|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|---------|
| 2.498 | -3.370 | .00400 | -.00670 | .12600 | .10560 | .00110 | -.00130 | .06780 | .02050 | .00080 | .00800 |
| 2.498 | 3.160 | .00000 | -.00620 | .12600 | .10590 | -.00050 | .00010 | -.00270 | .02010 | .00050 | .00240 |
| GRADIENT | | -.00063 | .00008 | -.00000 | .00005 | -.00025 | .00022 | -.01785 | -.00006 | -.00052 | -.01572 |

RUN NO. 289/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.502 | -3.410 | -.01700 | -.00840 | .10360 | .09130 | .00140 | -.00160 | .05410 | .01230 | -.01560 | -.18230 |
| 3.502 | 3.190 | -.02000 | -.00830 | .10290 | .09060 | -.00110 | .00100 | -.05100 | .01240 | -.01950 | -.21480 |
| GRADIENT | | -.00045 | .00002 | -.00011 | -.00011 | -.00038 | .00009 | -.01592 | .00002 | -.00044 | -.00432 |

(REB003) (26 MAY 73)

TABULATED SOURCE FORCE DATA-0A12C

AMES 87-707-0A12 02A

DATE 26 SEP 73

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
RUDDER = .000 RUSSLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0350 SCALE

RUN NO. 282/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 2.498 | -6.520 | .31800 | -.01900 | .11780 | .09450 | .00520 | .00080 | .10580 | .02340 | .29670 | 1.99900 |
| 2.498 | -3.340 | .31400 | -.01770 | .11690 | .09400 | .00250 | .00020 | .09400 | .02290 | .29240 | 1.98700 |
| 2.498 | 3.020 | .31300 | -.01760 | .11580 | .09350 | -.00250 | -.00130 | -.04150 | .02230 | .29220 | 1.99400 |
| 2.498 | 6.200 | .31600 | -.01920 | .11640 | .09300 | -.00500 | -.00200 | -.09490 | .02340 | .29340 | 2.01500 |
| | GRADIENT | -.00016 | .00002 | -.00017 | -.00008 | -.00079 | -.00024 | -.01502 | -.00009 | -.00006 | .00010 |

RUN NO. 288/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|--------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.502 | -6.740 | .22700 | -.01430 | .09390 | .08070 | .00600 | -.00060 | .09100 | .01330 | .20940 | 1.78800 |
| 3.502 | -3.460 | .22900 | -.01380 | .09330 | .08020 | .00280 | -.00030 | .04320 | .01310 | .21190 | 1.79000 |
| 3.502 | 3.140 | .22900 | -.01370 | .09270 | .07960 | -.00310 | -.00020 | -.03830 | .01310 | .21180 | 1.79400 |
| 3.502 | 6.440 | .22600 | -.01430 | .09290 | .08020 | -.00600 | -.00020 | -.08560 | .01270 | .20950 | 1.78500 |
| | GRADIENT | .00000 | .00002 | -.00009 | -.00009 | -.00089 | .00002 | -.01265 | .00000 | -.00002 | .00061 |

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-0A12C

(082904) (28 MAY 73)

AVES 87-757-0A12 ORA

PARAMETRIC DATA

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN. ALPHA = 20.000 ELEVON = .000
 LREF = 39.8490 IN. YMRP = .0000 IN. RUDDER = .000
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

RUN NO. 291/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.490 | .56500 | -.02510 | .10850 | .08900 | .00750 | .00710 | .08080 | .02350 | .61570 | 1.97170 |
| 2.498 | -3.310 | .68900 | -.02470 | .10950 | .08570 | .00300 | .00400 | .04660 | .02370 | .61900 | 1.98970 |
| 2.498 | 3.030 | .68600 | -.02500 | .10910 | .08450 | -.00330 | -.00600 | -.03260 | .02460 | .61710 | 1.97870 |
| 2.498 | 6.240 | .68300 | -.02510 | .10860 | .08390 | -.00770 | -.00940 | -.03000 | .02480 | .61420 | 1.97970 |
| GRADIENT | | -.00047 | -.00005 | -.00003 | -.00019 | -.00099 | -.00157 | -.01245 | .00014 | -.00030 | .00110 |

RUN NO. 287/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.502 | -6.710 | .56500 | -.01900 | .09340 | .07620 | .00790 | .00390 | .08470 | .01420 | .50460 | 1.95170 |
| 3.502 | -3.430 | .56800 | -.01870 | .09590 | .07800 | .00350 | .00220 | .04440 | .01300 | .50740 | 1.99470 |
| 3.502 | 3.160 | .56700 | -.01840 | .09010 | .07660 | -.00400 | -.00340 | -.02980 | .01350 | .50530 | 1.97370 |
| 3.502 | 6.470 | .56200 | -.01870 | .08960 | .07580 | -.00850 | -.00520 | -.07260 | .01360 | .50170 | 1.95870 |
| GRADIENT | | -.00015 | .00003 | -.00012 | -.00021 | -.00114 | -.00085 | -.01126 | .00008 | -.00015 | .00137 |

DATE 28 SEP 73 TABULATED SOURCE FOR W12C (R02005) (26 MAY 73)

AVES 6 1 02A

PARAMETRIC DATA

REFERENCE DATA
 SREF = 2.44 3.FT. XREF = 32.
 LREF = 39.8490 IN. YREF =
 BREF = 39.8490 IN. ZREF =
 SCALE = .0377 SCALE
 ALPHA = .000 ELEVON = .000
 RUDDER = -20.000 RUFLR = 40.000

RUN NO. 297/ 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|--------|--------|---------|--------|---------|--------|---------|---------|
| 2.498 | -6.440 | .00400 | -.00820 | .12520 | .10370 | -.00280 | .00740 | .09820 | .02150 | .00380 | .03640 |
| 2.498 | -3.300 | .00000 | -.00410 | .12870 | .10820 | -.00380 | .00860 | .07680 | .02090 | .00090 | .00460 |
| 2.498 | -1.160 | -.00100 | -.00220 | .13030 | .11060 | -.00450 | .00900 | -.02020 | .01980 | -.00090 | -.00380 |
| 2.498 | 3.060 | -.00100 | -.00210 | .13450 | .11370 | -.00540 | .00940 | -.07520 | .02080 | -.00130 | -.01180 |
| 2.498 | 6.290 | -.00500 | -.00350 | .13510 | .11340 | -.00610 | .00790 | -.13300 | .02170 | -.00510 | -.04520 |
| 2.498 | GRADIENT | -.00016 | .00031 | .00091 | .00087 | -.00025 | .00013 | -.01761 | .00005 | -.00028 | -.00237 |

RUN NO. 294/ 0 RV/L = 1.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|--------|--------|---------|--------|---------|---------|---------|---------|
| 3.901 | -6.670 | -.01600 | -.01040 | .10250 | .08980 | -.00110 | .00430 | .09340 | .01270 | -.01600 | -.17840 |
| 3.901 | -3.420 | -.01800 | -.00730 | .10520 | .09310 | -.00240 | .00620 | .03660 | .01210 | -.01840 | -.19320 |
| 3.901 | -1.160 | -.02000 | -.00540 | .10700 | .09530 | -.00350 | .00720 | -.01630 | .01180 | -.02090 | -.21540 |
| 3.901 | 3.180 | -.02300 | -.00420 | .11140 | .09940 | -.00460 | .00840 | -.06840 | .01200 | -.02260 | -.22790 |
| 3.901 | 6.530 | -.02600 | -.00430 | .11450 | .10100 | -.00570 | .00950 | -.12410 | .01350 | -.02690 | -.26210 |
| 3.901 | GRADIENT | -.00076 | .00047 | .00094 | .00096 | -.00033 | .00033 | -.01591 | -.00001 | -.00064 | -.00450 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

PAGE 102

ANES 87-707-0A12 OEA

(R030706) (28 MAY 73)

REFERENCE DATA

SREF = 2.4210 50.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
 RUDDER = -20.000 RUDDFLR = 40.000

RUN NO. 298/ 0 RV/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CEB | CYN | CY | CABO | CL | L/D |
|----------|--------|---------|---------|--------|--------|---------|---------|---------|---------|---------|---------|
| 2.498 | -6.520 | .31600 | -.01920 | .11630 | .09260 | .00150 | .00810 | .08760 | .02370 | .29340 | 2.02600 |
| 2.498 | -3.340 | .31200 | -.01610 | .11880 | .09670 | -.00120 | .00780 | .03480 | .02280 | .29040 | 1.95400 |
| 2.498 | -1.160 | .30600 | -.01390 | .11970 | .09820 | -.00370 | .00710 | -.01360 | .02150 | .28400 | 1.88600 |
| 2.498 | 3.020 | .30700 | -.01370 | .12270 | .10060 | -.00380 | .00560 | -.06020 | .02210 | .28480 | 1.86300 |
| 2.498 | 6.210 | .30900 | -.01430 | .12600 | .10250 | -.00380 | .00460 | -.11310 | .02350 | .28630 | 1.83100 |
| GRADIENT | | -.00079 | .00038 | .00061 | .00072 | -.00072 | -.00035 | -.01494 | -.00011 | -.00038 | -.01431 |

RUN NO. 299/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CEB | CYN | CY | CABO | CL | L/D |
|----------|--------|---------|---------|--------|--------|---------|--------|---------|---------|---------|---------|
| 3.501 | -6.750 | .23900 | -.01540 | .09170 | .07860 | .00360 | .00440 | .08100 | .01300 | .21350 | 1.82200 |
| 3.501 | -3.450 | .22800 | -.01340 | .09350 | .08000 | .00040 | .00480 | .03480 | .01360 | .21040 | 1.77900 |
| 3.501 | -1.160 | .22200 | -.01130 | .09570 | .08220 | -.00260 | .00500 | -.00990 | .01350 | .20390 | 1.73000 |
| 3.501 | 3.340 | .21900 | -.01030 | .09880 | .08640 | -.00560 | .00510 | -.05370 | .01250 | .20040 | 1.62600 |
| 3.501 | 6.440 | .21800 | -.01010 | .10160 | .08850 | -.00850 | .00490 | -.10080 | .01300 | .19930 | 1.59100 |
| GRADIENT | | -.00137 | .00047 | .00030 | .00097 | -.00091 | .00005 | -.01343 | -.00017 | -.00152 | -.02522 |

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-0A12C

(RB2017) (26 MAY 73)

AMES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .0000
RUDDER = -20.000 RUDDER = 40.000

REFERENCE DATA

SREF = 2.4210 58.47. YREF = 32.3000 IN.
LREF = 39.6490 IN. YREF = .0000 IN.
BREF = 39.6490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 299/ 0 RV/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.480 | .69000 | -.02490 | .10950 | .08990 | .00520 | .01220 | .07810 | .02360 | .61960 | 1.96600 |
| 2.498 | -3.320 | .68900 | -.02270 | .11330 | .09000 | .00000 | .01010 | .03100 | .02330 | .61440 | 1.94000 |
| 2.498 | -1.190 | .68100 | -.02110 | .11320 | .09020 | -.00340 | .00560 | -.00930 | .02300 | .61000 | 1.92800 |
| 2.498 | 3.040 | .68400 | -.02260 | .11290 | .08850 | -.00600 | -.00330 | -.04690 | .02440 | .61360 | 1.94300 |
| 2.498 | 6.240 | .68300 | -.02250 | .11300 | .08860 | -.00980 | -.00480 | -.09210 | .02440 | .61100 | 1.92900 |
| GRADIENT | | -.00016 | .00002 | -.00006 | -.00024 | -.00094 | -.00164 | -.01225 | .00017 | -.00012 | .00043 |

RUN NO. 296/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|----------|--------|---------|---------|--------|---------|---------|---------|---------|--------|---------|---------|
| 3.901 | -6.710 | .57100 | -.01930 | .09040 | .07670 | .00660 | .00700 | .07640 | .01360 | .51040 | 1.90800 |
| 3.901 | -3.440 | .57400 | -.01770 | .09330 | .08060 | .00170 | .00580 | .03440 | .01270 | .51130 | 1.88000 |
| 3.901 | -1.190 | .57200 | -.01650 | .09340 | .08040 | -.00220 | .00310 | -.00330 | .01300 | .50990 | 1.88000 |
| 3.901 | 3.160 | .56900 | -.01700 | .09350 | .07990 | -.00580 | .00000 | -.04050 | .01360 | .50730 | 1.88100 |
| 3.901 | 6.470 | .55700 | -.01660 | .09420 | .08040 | -.01020 | -.00210 | -.08370 | .01390 | .49580 | 1.86900 |
| GRADIENT | | -.00076 | .00011 | .00003 | -.00011 | -.00114 | -.00288 | -.01135 | .00014 | -.00061 | .00015 |

DATE 26 SEP 75

TABULATED SOURCE FORCE DATA-QM12C

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(RMS'008) (26 MAY 75

AMES 87-707-QM12 Q2A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = .000 ELEVON = 10.000
 RUDDER = .000 RUDDFLR = 40.000

RUN NO. 303/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/DF |
|-------|----------|--------|---------|---------|--------|---------|---------|---------|---------|--------|--------|
| 2.498 | -6.440 | .02900 | -.01690 | .13060 | .10770 | .00260 | -.00200 | .11940 | .02290 | .02940 | .27220 |
| 2.498 | -3.350 | .02700 | -.01430 | .13070 | .10870 | .00120 | -.00080 | .05940 | .02210 | .02730 | .25170 |
| 2.498 | -1.160 | .02900 | -.01330 | .12970 | .10390 | .00030 | -.00040 | .00380 | .02090 | .02890 | .26570 |
| 2.498 | 3.080 | .02900 | -.01430 | .13030 | .10890 | -.00060 | -.00010 | -.05050 | .02140 | .02890 | .26560 |
| 2.498 | 6.290 | .03000 | -.01710 | .13000 | .10750 | -.00200 | .00130 | -.11200 | .02280 | .02980 | .27720 |
| 2.498 | GRADIENT | .00031 | -.00000 | -.00005 | .00003 | -.00028 | .00011 | -.01726 | -.00011 | .00025 | .00229 |

RUN NO. 300/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/DF |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3.501 | -6.670 | -.00300 | -.01470 | .10730 | .09400 | .00340 | -.00330 | .11200 | .01330 | -.00290 | -.02710 |
| 3.501 | -3.420 | -.00300 | -.01310 | .10610 | .09320 | .00180 | -.00160 | .05600 | .01290 | -.00270 | -.02930 |
| 3.501 | -1.170 | -.00400 | -.01250 | .10450 | .09250 | .00030 | -.00020 | .00400 | .01200 | -.00370 | -.04120 |
| 3.501 | 3.190 | -.00400 | -.01300 | .10520 | .09290 | -.00130 | .00120 | -.04950 | .01230 | -.00430 | -.04580 |
| 3.501 | 6.530 | -.00500 | -.01460 | .10550 | .09270 | -.00030 | .00280 | -.10570 | .01290 | -.00460 | -.05020 |
| 3.501 | GRADIENT | -.00015 | .00001 | -.00013 | -.00004 | -.00047 | .00042 | -.01596 | -.00009 | -.00024 | -.00249 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

PAGE 155

(R082009) (26 MAY 73)

AMES 67-707-0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 PREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = 10.000
 RUDDER = .000 RUDDFLR = 40.000

RUN NO. 304/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MAON | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/DF |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.520 | .34800 | -.02910 | .12840 | .10420 | .00560 | .00090 | .10570 | .02410 | .32460 | 1.99600 |
| 2.498 | -3.340 | .34500 | -.02760 | .12720 | .10370 | .00280 | .00090 | .05450 | .02350 | .32200 | 1.98800 |
| 2.498 | -1.160 | .34300 | -.02660 | .12490 | .10240 | -.00010 | -.00030 | .00700 | .02260 | .31940 | 1.98100 |
| 2.498 | 3.020 | .34400 | -.02160 | .12590 | .10210 | -.00270 | -.00130 | -.04170 | .02380 | .32140 | 2.00100 |
| 2.498 | 6.200 | .34800 | -.02910 | .12620 | .10220 | -.00550 | -.00200 | -.09540 | .02400 | .32490 | 2.01400 |
| GRADIENT | | -.00016 | .00000 | -.00020 | -.00025 | -.00086 | -.00025 | -.01513 | .00005 | -.00009 | .00204 |

RUN NO. 301/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MAON | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/DF |
|----------|--------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|
| 3.501 | -6.750 | .24800 | -.02200 | .10090 | .08670 | .00690 | -.00080 | .09540 | .01390 | .22900 | 1.78700 |
| 3.501 | -3.450 | .24800 | -.02130 | .09940 | .08520 | .00350 | -.00040 | .04930 | .01420 | .22960 | 1.81200 |
| 3.501 | -1.160 | .24900 | -.02090 | .09830 | .08520 | .00000 | -.00030 | .00590 | .01310 | .23030 | 1.80600 |
| 3.501 | 3.130 | .25100 | -.02130 | .09840 | .08490 | -.00360 | .00000 | -.03920 | .01350 | .23190 | 1.81700 |
| 3.501 | 6.440 | .24900 | -.02200 | .09900 | .08520 | -.00690 | .00010 | -.08710 | .01370 | .23030 | 1.80400 |
| GRADIENT | | .00046 | -.00000 | -.00015 | -.00005 | -.00104 | .00006 | -.01345 | -.00011 | .00035 | .00076 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-QA12C

PAGE 106

(R02010) (26 MAY 73)

AWES 07-707-QA12 QEA

REFERENCE DATA

SREF = 2.4213 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.0490 IN. YMRP = .0000 IN.
 BREF = 39.0490 IN. ZMRP = .0000 IN.
 SCALE = .0390 SCALE

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = 10.000
 RUDDER = .000 RUDFLR = 40.000

RUN NO. 303/ 0 RNVL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|--------|---------|--------|---------|---------|---------|---------|--------|--------|---------|
| 2.498 | -6.480 | .79000 | -.03890 | .12420 | .10000 | .00810 | .00700 | .09280 | .02430 | .65280 | 1.91100 |
| 2.498 | -3.320 | .73900 | -.03880 | .12430 | .10080 | .00330 | .00390 | .04810 | .02390 | .63730 | 1.91000 |
| 2.498 | -1.160 | .73900 | -.03780 | .12470 | .10260 | -.00040 | -.00070 | .06890 | .02410 | .63520 | 1.90900 |
| 2.498 | 3.040 | .73800 | -.03930 | .12440 | .09980 | -.00340 | -.00600 | -.03240 | .02450 | .65990 | 1.91200 |
| 2.498 | 6.240 | .73600 | -.03910 | .12440 | .09920 | -.00820 | -.00920 | -.07940 | .02530 | .65780 | 1.91100 |
| 2.498 | GRADIENT | .00047 | -.00006 | .00002 | -.00014 | -.00105 | -.00156 | -.01266 | .00016 | .00041 | .00032 |

RUN NO. 302/ 0 RNVL = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.501 | -6.710 | .60900 | -.03130 | .10300 | .08900 | .00860 | .00360 | .08540 | .01400 | .53860 | 1.86300 |
| 3.501 | -3.440 | .60800 | -.03100 | .10360 | .09320 | .00370 | .00210 | .04450 | .01360 | .54130 | 1.86400 |
| 3.501 | -1.190 | .61100 | -.03090 | .10270 | .08970 | -.00040 | -.00060 | .00760 | .01300 | .54380 | 1.86100 |
| 3.501 | 3.160 | .60700 | -.03080 | .10290 | .08910 | -.00450 | -.00320 | -.03130 | .01360 | .54040 | 1.86200 |
| 3.501 | 6.480 | .59900 | -.03100 | .10160 | .08690 | -.00930 | -.00490 | -.07530 | .01470 | .53390 | 1.86200 |
| 3.501 | GRADIENT | -.00015 | .00003 | -.00014 | -.00017 | -.00124 | -.00080 | -.01149 | .00003 | -.00014 | -.00030 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

PAGE 107

(R82011) (28 MAY 75)

AMES 87-M17-0A12 OCA

REFERENCE DATA

SREF = 2.4210 58.FT. YMRP = 32.3000 IN.
 LREF = 39.6490 IN. YMRP = .0000 IN.
 BREF = 39.6490 IN. ZMRP = .0000 IN.
 SCALE = .0000 SCALE

ALPHA = .000 ELEVON = -20.000
 RUDDER = .000 RUDDER = 40.000

PARAMETRIC DATA

RUN NO. 309/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|--------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.440 | -.04900 | .00460 | .13390 | .11360 | .00150 | -.00290 | .12070 | .02030 | -.04840 | -.42340 |
| 2.498 | -3.300 | -.03100 | .00680 | .13300 | .11490 | .00060 | -.00160 | .05980 | .01800 | -.05060 | -.44040 |
| 2.498 | -.220 | -.03200 | .00790 | .13200 | .11490 | .00010 | -.00040 | .00380 | .01710 | -.05160 | -.44840 |
| 2.498 | 3.070 | -.03000 | .00690 | .13200 | .11390 | -.00020 | .00030 | -.05200 | .01810 | -.05030 | -.44190 |
| 2.498 | 6.900 | -.03000 | .00430 | .13160 | .11170 | -.00100 | .00210 | -.11400 | .01990 | -.05000 | -.44720 |
| 2.498 | GRADIENT | .00016 | .00001 | -.00016 | -.00016 | -.00013 | .00030 | -.01754 | .00002 | .00005 | -.00021 |

RUN NO. 306/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3.502 | -6.670 | -.05000 | -.00190 | .10960 | .09870 | .00090 | -.00400 | .11200 | .01090 | -.04940 | -.49960 |
| 3.502 | -3.410 | -.04800 | -.00070 | .10790 | .09740 | .00060 | -.00210 | .05540 | .01040 | -.04780 | -.49050 |
| 3.502 | -.160 | -.04700 | -.00040 | .10600 | .09630 | .00020 | -.00030 | .00270 | .00980 | -.04710 | -.48940 |
| 3.502 | 3.180 | -.04900 | -.00080 | .10700 | .09670 | -.00010 | .00150 | -.00300 | .01030 | -.04930 | -.50360 |
| 3.502 | 6.530 | -.05000 | -.00180 | .10720 | .09580 | -.00060 | .00350 | -.10890 | .01140 | -.05040 | -.52580 |
| 3.502 | GRADIENT | -.00015 | -.00002 | -.00013 | -.00011 | -.00011 | .00035 | -.01607 | -.00001 | -.00023 | -.00291 |

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-0412C

(RB2012) (26 MAY 73)

AMES 07-737-0412 CCA

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -20.000
RUDDER = .000 RUDDER = 40.000

REFERENCE DATA

REF = 2.4210 SA.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .5000 SCALE

RUN NO. 310/ 0 RVL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| | BETA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/OF |
|-------|--------|--------|---------|---------|--------|---------|---------|---------|---------|--------|---------|
| 2.498 | -6.530 | .26400 | -.00480 | .11920 | .09820 | .00370 | .00000 | .10580 | .02100 | .24310 | 1.71000 |
| 2.498 | -3.340 | .26200 | -.00420 | .11590 | .09680 | .00200 | .00000 | .03000 | .01910 | .24180 | 1.71400 |
| 2.498 | -1.170 | .26300 | -.00350 | .11330 | .09570 | .00000 | -.00020 | .00370 | .01760 | .24290 | 1.72300 |
| 2.498 | 3.020 | .26600 | -.00460 | .11540 | .09690 | -.00170 | -.00080 | -.04590 | .01850 | .24470 | 1.72400 |
| 2.438 | 6.200 | .26800 | -.00390 | .11780 | .09700 | -.00340 | -.00100 | -.10030 | .02090 | .24540 | 1.72900 |
| | | .00060 | -.00006 | -.00008 | .00002 | -.00058 | -.00013 | -.01549 | -.00009 | .00049 | .00157 |

RUN NO. 307/ 0 RVL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| | BETA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/OF |
|-------|--------|---------|---------|---------|---------|---------|---------|---------|--------|--------|---------|
| 3.502 | -6.750 | .19400 | -.00600 | .09340 | .08310 | .00470 | -.00090 | .09390 | .01290 | .17640 | 1.53100 |
| 3.502 | -3.480 | .19400 | -.00560 | .09400 | .08270 | .00230 | -.00050 | .04780 | .01130 | .17670 | 1.53800 |
| 3.502 | -1.160 | .19200 | -.00510 | .09290 | .08140 | .00010 | -.00020 | .00350 | .01080 | .17770 | 1.55300 |
| 3.502 | 3.140 | .19400 | -.00560 | .09270 | .08110 | -.00210 | .00020 | -.04230 | .01160 | .17730 | 1.55800 |
| 3.502 | 6.430 | .19200 | -.00620 | .09370 | .08180 | -.00450 | .00040 | -.09110 | .01270 | .17480 | 1.53300 |
| | | -.00000 | .00000 | -.00020 | -.00024 | -.00067 | .00011 | -.01365 | .00005 | .00009 | .00053 |

(RB2013) (26 MAY 73)

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-012C
AVES 07-707-0112 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -20.000
RUDDER = .000 RUDDFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 311/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|--------|---------|---------|---------|---------|---------|---------|--------|--------|---------|
| 2.496 | -6.490 | .02700 | -.00920 | .10680 | .08440 | .00380 | .00640 | .09390 | .02250 | .56120 | 1.91900 |
| 2.496 | -3.330 | .62500 | -.00870 | .10780 | .08450 | .00290 | .00370 | .04740 | .02330 | .55910 | 1.92300 |
| 2.496 | -1.160 | .62800 | -.00790 | .10790 | .08370 | -.00030 | -.00050 | .00710 | .02360 | .56020 | 1.92500 |
| 2.496 | 3.040 | .62800 | -.00900 | .10670 | .08300 | -.00240 | -.00350 | -.00360 | .02370 | .55200 | 1.92700 |
| 2.496 | 6.240 | .62600 | -.00920 | .10680 | .08290 | -.00360 | -.00460 | -.00310 | .02380 | .56000 | 1.92100 |
| 2.496 | GRADIENT | .00547 | -.00005 | -.00017 | -.00024 | -.00074 | -.00144 | -.01272 | .00006 | .00046 | .00060 |

RUN NO. 308/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3.902 | -6.710 | .51900 | -.00790 | .08940 | .07720 | .00700 | .00360 | .08470 | .01210 | .46250 | 1.85200 |
| 3.902 | -3.440 | .52300 | -.00680 | .09220 | .07750 | .00310 | .00200 | .04350 | .01290 | .46340 | 1.85200 |
| 3.902 | -1.160 | .52100 | -.00620 | .08970 | .07760 | -.00020 | -.00060 | .00620 | .01210 | .46400 | 1.85800 |
| 3.902 | 3.160 | .52300 | -.00680 | .08940 | .07660 | -.00390 | -.00310 | -.00240 | .01280 | .46310 | 1.86100 |
| 3.902 | 6.470 | .51400 | -.00710 | .08840 | .07750 | -.00740 | -.00490 | -.00630 | .01300 | .45790 | 1.85900 |
| 3.902 | GRADIENT | -.00045 | .00003 | -.00012 | -.00011 | -.00100 | -.00077 | -.01150 | -.00001 | -.00005 | -.00015 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0412C

PAGE 110

(R34014) (28 SEP 73)

AVES 87-707-0412 Q2A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0390 SCALE

PARAMETRIC DATA

ALPHA = .000 ELEVON = -40.000
 RUDDER = .000 RUDDLR = 40.000

RUN NO. 317/ 0 RNL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 2.498 | -6.440 | -.09600 | .01210 | .15630 | .13440 | .00040 | -.00480 | .12420 | .02190 | -.09530 | -.77310 |
| 2.498 | -3.300 | -.09400 | .01390 | .15480 | .13290 | .00000 | -.00280 | .06130 | .02230 | -.09430 | -.71140 |
| 2.498 | -1.170 | -.09200 | .01470 | .15310 | .13200 | .00010 | -.00070 | .00150 | .02110 | -.09590 | -.71950 |
| 2.498 | 3.060 | -.09200 | .01360 | .15300 | .13140 | .00020 | .00090 | -.05530 | .02170 | -.09210 | -.76140 |
| 2.498 | 6.290 | -.09300 | .01090 | .15110 | .12880 | -.00020 | .00360 | -.12030 | .02230 | -.09300 | -.72170 |
| 2.498 | GRADIENT | .00032 | -.00005 | -.00028 | -.00017 | .00003 | .00058 | -.01833 | -.00709 | .00035 | .05119 |

RUN NO. 314/ 0 RNL = 1.92 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.903 | -6.670 | -.08300 | .00400 | .12420 | .11110 | -.00130 | -.00600 | .11310 | .01310 | -.08270 | -.74290 |
| 3.903 | -3.420 | -.08000 | .00450 | .12280 | .11000 | -.00060 | -.00320 | .05380 | .01260 | -.07950 | -.72250 |
| 3.903 | -1.170 | -.07700 | .00460 | .12030 | .10740 | .00010 | -.00050 | .00150 | .01290 | -.07780 | -.71650 |
| 3.903 | 3.180 | -.07900 | .00430 | .12140 | .10780 | .00090 | .00260 | -.05400 | .01360 | -.07920 | -.73170 |
| 3.903 | 6.520 | -.08200 | .00360 | .12270 | .10910 | .00150 | .00540 | -.11260 | .01390 | -.08230 | -.75320 |
| 3.903 | GRADIENT | .00015 | -.00003 | -.00018 | -.00033 | .00023 | .00088 | -.01664 | .00015 | .00004 | -.00137 |

DATE 26 SEP 73 PAGE 111
 TABULATED SOURCE FORCE DATA-0A12C (R02013) (26 MAY 73)
 AMES 07-707-0A12 CBA

REFERENCE DATA
 SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.6490 IN. YREF = .0000 IN.
 PREF = 39.6490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -40.000
 RUSSER = .000 RUSSLR = 40.000

RUN NO. 316/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|-------|----------|--------|---------|---------|---------|---------|---------|---------|---------|--------|---------|
| 2.490 | -6.520 | .23000 | .00090 | .13370 | .11000 | .00250 | -.00110 | .10670 | .02300 | .20600 | 1.39000 |
| 2.490 | -3.340 | .23100 | .00170 | .13260 | .10760 | .00140 | -.00060 | .05230 | .02300 | .20400 | 1.40000 |
| 2.490 | -.170 | .23000 | .00240 | .12860 | .10680 | .00020 | -.00010 | .00210 | .02160 | .20760 | 1.42500 |
| 2.490 | 3.020 | .23300 | .00150 | .13000 | .10720 | -.00110 | -.00020 | -.04830 | .02260 | .21020 | 1.43800 |
| 2.490 | 6.200 | .23200 | .00040 | .13160 | .10630 | -.00210 | .00040 | -.10580 | .02330 | .20920 | 1.42300 |
| 2.490 | GRADIENT | .00032 | -.00003 | -.00009 | -.00006 | -.00039 | .00006 | -.01590 | -.00003 | .00720 | .00095 |

RUN NO. 315/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | LZF |
|-------|----------|--------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.503 | -6.750 | .17000 | -.00130 | .10660 | .09210 | .00000 | -.00280 | .00020 | .01450 | .15120 | 1.26300 |
| 3.503 | -3.480 | .17200 | -.00080 | .10610 | .09230 | .00120 | -.00170 | .04790 | .01380 | .15370 | 1.27300 |
| 3.503 | -.160 | .17200 | -.00040 | .10480 | .09040 | .00020 | -.00040 | .00140 | .01400 | .15350 | 1.28700 |
| 3.503 | 3.130 | .17200 | -.00090 | .10520 | .09120 | -.00110 | .00120 | -.04510 | .01400 | .15320 | 1.27800 |
| 3.503 | 6.430 | .16900 | -.00160 | .10470 | .09000 | -.00280 | .00210 | -.09800 | .01470 | .15330 | 1.27400 |
| 3.503 | GRADIENT | .00000 | -.00002 | -.00014 | -.00017 | -.00035 | .00044 | -.01402 | .00003 | -.00008 | .00075 |

DATE 26 SEP 75 TABULATED SOURCE FORCE DATA-0A12C

(R23016) (26 MAY 75)

AMES 87-757-0A12 ORA

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -20.000
RUDER = .500 RUDDER = 40.000

REFERENCE DATA

REF = 2.4210 50.FT. YREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 319/ 0 RVL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | LZF |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.490 | .60300 | -.00090 | .11790 | .09300 | .00410 | .00430 | .09770 | .02490 | .53580 | 1.83300 |
| 2.498 | -3.320 | .60300 | -.00030 | .11770 | .09230 | .00170 | .00060 | .04730 | .02350 | .53590 | 1.83300 |
| 2.498 | -1.160 | .60300 | -.00230 | .11760 | .09210 | -.00010 | -.00050 | .00350 | .02350 | .53590 | 1.83300 |
| 2.498 | 3.040 | .60200 | -.00370 | .11710 | .09100 | -.00140 | -.00460 | -.03710 | .02510 | .53540 | 1.84000 |
| 2.498 | 6.240 | .60300 | -.00410 | .11690 | .09110 | -.00370 | -.00630 | -.03330 | .02530 | .53570 | 1.83700 |
| 2.498 | GRADIENT | -.00016 | -.00006 | -.00009 | -.00020 | -.00049 | -.00113 | -.01336 | .00009 | -.00004 | .00063 |

RUN NO. 316/ 0 RVL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | LZF |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 3.503 | -6.720 | .50000 | -.00000 | .09810 | .08340 | .00620 | .00240 | .10670 | .01470 | .44230 | 1.76500 |
| 3.503 | -3.440 | .50400 | -.00240 | .09930 | .08300 | .00270 | .00140 | .04380 | .01450 | .44520 | 1.77200 |
| 3.503 | -1.160 | .50300 | -.00170 | .09380 | .08480 | .00000 | -.00050 | .00390 | .01400 | .44480 | 1.77500 |
| 3.503 | 3.190 | .50200 | -.00230 | .09880 | .08410 | -.00280 | -.00270 | -.03440 | .01470 | .44340 | 1.77700 |
| 3.503 | 6.470 | .49700 | -.00290 | .09700 | .08160 | -.00530 | -.00160 | -.08540 | .01530 | .43960 | 1.78000 |
| 3.503 | GRADIENT | -.00030 | .00001 | -.00011 | -.00014 | -.00083 | -.00062 | -.01187 | .00003 | -.00027 | .00030 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

PAGE 113

(REJ0177) (28 MAY 73)

AMES 67-707-0A12 CBA

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3220 IN.
 LREF = 39.6490 IN. YREF = .0000 IN.
 BREF = 39.6430 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

BETA = .0000 ELEVON = .0000
 RUDDER = .0000 RUDDER = .0000

PARAMETRIC DATA

RUN NO. 322/ 0 RNL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | ALPHA | ON | CLM | CA | CAF | CEL | CYN | CY | CASC | CL | L/D |
|----------|--------|---------|---------|---------|---------|---------|---------|--------|--------|---------|---------|
| 2.498 | 15.200 | .50300 | -.02120 | .11240 | .08710 | .00000 | -.00020 | .01010 | .02330 | .46210 | 2.14200 |
| 2.498 | 20.250 | .69600 | -.02440 | .10720 | .08260 | -.00000 | -.00000 | .01070 | .02460 | .62470 | 1.96100 |
| 2.498 | 25.180 | .91100 | -.03000 | .10400 | .07790 | -.00000 | -.00000 | .01130 | .02610 | .79150 | 1.72700 |
| 2.498 | 30.150 | 1.14000 | -.03380 | .09830 | .07280 | -.00000 | -.00000 | .01150 | .02560 | .94480 | 1.49500 |
| 2.498 | 35.120 | 1.38600 | -.04350 | .09430 | .06750 | -.00000 | -.00000 | .01190 | .02680 | 1.09200 | 1.27600 |
| 2.498 | 38.670 | 1.54700 | -.04840 | .09200 | .06310 | -.00000 | -.00000 | .01210 | .02690 | 1.16700 | 1.14700 |
| GRADIENT | | .04486 | -.03118 | -.00088 | -.00096 | -.00003 | -.00003 | .00007 | .00008 | .00044 | -.04341 |

RUN NO. 320/ 0 RNL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | ALPHA | ON | CLM | CA | CAF | CEL | CYN | CY | CASC | CL | L/D |
|----------|--------|---------|---------|---------|---------|---------|---------|--------|---------|---------|---------|
| 3.501 | 15.160 | .39600 | -.01680 | .09090 | .07380 | .00020 | -.00020 | .00080 | .01310 | .38260 | 2.03200 |
| 3.501 | 20.230 | .57300 | -.01870 | .08990 | .07490 | .00000 | -.00000 | .00990 | .01300 | .51190 | 1.95700 |
| 3.501 | 25.240 | .77400 | -.02190 | .08960 | .07520 | -.00010 | -.00000 | .01040 | .01440 | .66730 | 1.67800 |
| 3.501 | 30.110 | .98800 | -.02640 | .08880 | .07380 | -.00000 | -.00000 | .01080 | .01500 | .81230 | 1.47700 |
| 3.501 | 35.250 | 1.22100 | -.03260 | .08680 | .07140 | -.00050 | -.00000 | .01110 | .01540 | .95590 | 1.25000 |
| 3.501 | 38.630 | 1.37600 | -.03700 | .08560 | .07110 | -.00060 | -.00000 | .01120 | .01450 | 1.03300 | 1.12700 |
| GRADIENT | | .04213 | -.00087 | -.00022 | -.00021 | -.00003 | -.00003 | .00009 | -.00001 | .00037 | -.04157 |

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-0A12C

(R02018) (26 MAY 73)

AMES 87-737-0A12 CBA

PARAMETRIC DATA

ALPHA = 30.000 ELEVON = .000
RUDDER = .000 RUFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 323/ 0 RVL = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.400 | 1.14100 | -.03360 | .10280 | .07560 | .00820 | .01200 | .08220 | .02720 | .94870 | 1.48800 |
| 2.498 | -3.310 | 1.14400 | -.03650 | .09990 | .07310 | .00240 | .00750 | .04420 | .02680 | .99230 | 1.49300 |
| 2.498 | -.130 | 1.14000 | -.03570 | .09810 | .07280 | -.00070 | -.00040 | .01180 | .02530 | .94940 | 1.49300 |
| 2.498 | 3.060 | 1.13700 | -.03640 | .09900 | .07190 | -.00290 | -.00900 | -.02280 | .02720 | .94750 | 1.49800 |
| 2.498 | 6.240 | 1.14000 | -.03610 | .10160 | .07500 | -.00820 | -.01350 | -.06340 | .02660 | .94890 | 1.48900 |
| | GRADIENT | -.00110 | .00002 | -.00014 | -.00019 | -.00083 | -.00259 | -.01052 | .00016 | -.00075 | .00047 |

RUN NO. 321/ 0 RVL = 1.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|--------|---------|---------|---------|---------|---------|---------|
| 3.501 | -6.700 | .98700 | -.02670 | .09020 | .07510 | .00970 | .00650 | .07750 | .01510 | .81610 | 1.45700 |
| 3.501 | -3.420 | .99300 | -.02680 | .08930 | .07390 | .00170 | .00310 | .04560 | .01540 | .82230 | 1.46200 |
| 3.501 | -.130 | .99300 | -.02620 | .08860 | .07400 | -.00040 | -.00040 | .01100 | .01470 | .82180 | 1.46200 |
| 3.501 | 3.170 | .99100 | -.02640 | .08870 | .07400 | -.00510 | -.00420 | -.02530 | .01470 | .82560 | 1.46200 |
| 3.501 | 6.470 | .98200 | -.02620 | .08890 | .07350 | -.01020 | -.00770 | -.05970 | .01540 | .81250 | 1.46200 |
| | GRADIENT | -.00030 | .00006 | -.00009 | .00002 | -.00143 | -.00111 | -.01076 | -.00011 | -.00026 | .00000 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(RB5019) (26 MAY 73)

AMES 87-707-0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

ALPHA = 30.000 ELEVON = .000
 RUDDER = -20.000 RUDDLR = 40.000

RUN NO. 325/ 0 RNVL = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|---------|--------|--------|---------|
| 2.498 | -6.470 | 1.15700 | -.03480 | .10540 | .07790 | .00630 | .01570 | .07060 | .02750 | .95810 | 1.43700 |
| 2.498 | -3.300 | 1.16100 | -.03470 | .10290 | .07680 | .00380 | .01100 | .03430 | .02610 | .96040 | 1.46100 |
| 2.498 | -1.400 | 1.15800 | -.03430 | .10180 | .07650 | -.00270 | .00340 | .00110 | .02530 | .95800 | 1.46200 |
| 2.498 | 3.060 | 1.16000 | -.03390 | .10130 | .07470 | -.00520 | -.00320 | -.03330 | .02680 | .96050 | 1.46700 |
| 2.498 | 6.250 | 1.15800 | -.03490 | .10480 | .07820 | -.01030 | -.00950 | -.07390 | .02660 | .95890 | 1.45800 |
| 2.498 | GRADIENT | -.00016 | -.00019 | -.00025 | -.00033 | -.00094 | -.00252 | -.01063 | .00008 | .00002 | .00094 |

RUN NO. 324/ 0 RNVL = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|--------|--------|---------|---------|---------|--------|---------|---------|
| 3.902 | -6.700 | 1.01100 | -.02700 | .09110 | .07630 | .00880 | .00860 | .07160 | .01480 | .83190 | 1.43900 |
| 3.902 | -3.420 | 1.01800 | -.02690 | .09030 | .07610 | .00360 | .00480 | .04090 | .01430 | .83820 | 1.43700 |
| 3.902 | -1.130 | 1.01900 | -.02580 | .09150 | .07630 | -.00150 | .00160 | .00530 | .01520 | .83890 | 1.43700 |
| 3.902 | 3.170 | 1.01800 | -.02500 | .09320 | .07890 | -.00670 | -.00160 | -.03150 | .01440 | .83520 | 1.428 |
| 3.902 | 6.470 | 1.00600 | -.02510 | .09300 | .07780 | -.01160 | -.00580 | -.06370 | .01530 | .82700 | 1.43100 |
| 3.902 | GRADIENT | -.00000 | .00029 | .00044 | .00043 | -.00156 | -.00097 | -.01099 | .00002 | -.00046 | -.00121 |

REFERENCE DATA

SREF = 2.4210 SQ.FT.

LREF = 39.8490 IN.

BREF = 39.8490 IN.

SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 30.000

RUDER = .000

ELEVON = 10.000

RUDFLR = 40.000

RUN NO. 327/ 0

RVAL = 1.50

GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/Df |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 2.498 | -6.470 | 1.22300 | -.05580 | .12410 | .09780 | .00870 | .01120 | .08100 | .02640 | 1.00300 | 1.41000 |
| 2.498 | -3.300 | 1.22800 | -.05590 | .12190 | .09590 | .00340 | .00680 | .04290 | .02640 | 1.00700 | 1.42400 |
| 2.498 | -.130 | 1.22100 | -.05510 | .12090 | .09540 | -.00060 | -.00050 | .01080 | .02560 | 1.00200 | 1.42400 |
| 2.498 | 3.060 | 1.22400 | -.05570 | .12160 | .09540 | -.00410 | -.00890 | -.02490 | .02620 | 1.00900 | 1.42500 |
| 2.498 | 6.240 | 1.22600 | -.05570 | .12390 | .09790 | -.00880 | -.01260 | -.06690 | .02560 | 1.00600 | 1.41900 |
| GRADIENT | | -.00031 | .00003 | -.00005 | -.00002 | -.00118 | -.00241 | -.01054 | -.00003 | -.00031 | .00016 |

RUN NO. 326/ 0

RVAL = 1.98

GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/Df |
|----------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3.501 | -6.730 | 1.06200 | -.04420 | .11000 | .09530 | .01040 | .00610 | .07480 | .01470 | .86590 | 1.39200 |
| 3.501 | -3.420 | 1.07900 | -.04470 | .11020 | .09570 | .00900 | .00270 | .04350 | .01490 | .87710 | 1.39400 |
| 3.501 | -.130 | 1.07600 | -.04430 | .10970 | .09520 | -.00090 | -.00020 | .00900 | .01490 | .87790 | 1.39600 |
| 3.501 | 3.170 | 1.07400 | -.04420 | .10950 | .09520 | -.00600 | -.00350 | -.02740 | .01440 | .87650 | 1.39600 |
| 3.501 | 6.470 | 1.06400 | -.04400 | .10910 | .09490 | -.01100 | -.00790 | -.06080 | .01420 | .86850 | 1.39500 |
| GRADIENT | | -.00015 | .00008 | -.00011 | -.00008 | -.00167 | -.00094 | -.01076 | -.00002 | -.00009 | .00030 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

AVES 87-707-0A12 OZA

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(032021) (26 MAY 73)

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

ALPHA = 30.000 ELEVON = -20.000
 RUDDER = .000 RUCLFLR = 40.000

PARAMETRIC DATA

RUN NO. 329/ 0 RV/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/DIF |
|-------|----------|---------|---------|--------|--------|---------|---------|---------|--------|---------|---------|
| 2.498 | -6.470 | 1.07900 | -.01330 | .09640 | .06900 | .00720 | .01120 | .06140 | .02740 | .69760 | 1.46800 |
| 2.498 | -3.310 | 1.07900 | -.01470 | .09170 | .06310 | .00200 | .00690 | .04300 | .02660 | .69570 | 1.48000 |
| 2.498 | -.130 | 1.07400 | -.01390 | .09120 | .06320 | -.00050 | -.00020 | .00770 | .02600 | .69150 | 1.47900 |
| 2.498 | 3.060 | 1.07900 | -.01430 | .09200 | .06340 | -.00260 | -.00820 | -.03020 | .02660 | .69790 | 1.47900 |
| 2.498 | 6.230 | 1.07000 | -.01360 | .09520 | .06850 | -.00730 | -.01250 | -.07060 | .02670 | .88620 | 1.47000 |
| 2.498 | GRADIENT | -.00094 | .00006 | .00005 | .00005 | -.00072 | -.00237 | -.01149 | .00000 | -.00073 | -.00016 |

RUN NO. 328/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CN | CLM | CA | CAF | CBL | CYN | CY | CABO | CL | L/DIF |
|-------|----------|---------|---------|---------|--------|---------|---------|---------|---------|---------|---------|
| 3.903 | -6.700 | .94000 | -.00850 | .08640 | .07140 | .00910 | .00600 | .07490 | .01510 | .77330 | 1.43400 |
| 3.903 | -3.410 | .94700 | -.00840 | .08540 | .07080 | .00420 | .00260 | .04320 | .01450 | .77930 | 1.43800 |
| 3.903 | -.130 | .94700 | -.00780 | .08470 | .07070 | -.00030 | -.00030 | .00740 | .01400 | .77540 | 1.43800 |
| 3.903 | 3.170 | .94600 | -.00800 | .08510 | .07090 | -.00480 | -.00040 | -.03010 | .01430 | .77650 | 1.43800 |
| 3.903 | 6.470 | .93500 | -.00810 | .08520 | .07030 | -.00950 | -.00710 | -.06350 | .01480 | .77010 | 1.43800 |
| 3.903 | GRADIENT | -.00015 | .00006 | -.00005 | .00002 | -.00137 | -.00091 | -.01114 | -.00003 | -.00012 | .00000 |

REFERENCE DATA

| | | | |
|---------|---------------|--------|-------------|
| STEP = | 2.4210 SQ.FT. | XREP = | 32.3000 IN. |
| LEDF = | 39.8490 IN. | YREP = | .0000 IN. |
| BDEF = | 39.8490 IN. | ZREP = | .0000 IN. |
| SCALE = | .0000 SCALE | | |

PARAMETRIC DATA

| | | | |
|----------|--------|----------|--------|
| ALPHA = | 15.000 | ELEVON = | .000 |
| RUDDER = | .000 | RUCFLR = | 40.000 |

| | | | |
|----------|-------|------------|---------------------------------|
| Est. No. | 111/0 | BVL = 1.50 | GRADIENT INTERVAL = -5.00/ 5.00 |
|----------|-------|------------|---------------------------------|

[illegible]

| | | | |
|--------|---------|-----------|---------------------------------|
| FIN NO | 331 / 0 | RM = 1.98 | GRADIENT INTERVAL = -5.00/ 5.00 |
|--------|---------|-----------|---------------------------------|

[illegible]

DATE 26 SEP 73

PARAMETRIC DATA

BETA = .000 ELEVON = .000
RUDDER = .000 RUOFLR = 40.000

REFERENCE DATA

SREF = 2.4210 50.FT. XREF = 32.3000 IN.
LREF = 39.6490 IN. YREF = .0000 IN.
BREF = 39.6490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 290/ 0 RV/L = 1.46 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | ALPHA | CL | COF | L/OF | BETA |
|-------|----------|---------|--------|---------|---------|
| 2.498 | -.090 | -.00130 | .10450 | -.01210 | -.16000 |
| 2.498 | 4.960 | .14310 | .11250 | 1.27200 | -.16000 |
| 2.498 | 9.970 | .28940 | .14600 | 1.98200 | -.16000 |
| 2.498 | 14.890 | .44880 | .21140 | 2.12300 | -.16000 |
| 2.498 | 19.870 | .61430 | .31240 | 1.96600 | -.15000 |
| | GRADIENT | .02859 | .00158 | .25428 | .00000 |

RUN NO. 286/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | ALPHA | CL | COF | L/OF | BETA |
|-------|----------|---------|--------|---------|---------|
| 3.502 | -.020 | -.01800 | .08950 | -.20100 | -.16000 |
| 3.502 | 5.170 | .08770 | .09220 | .95140 | -.16000 |
| 3.502 | 10.130 | .20830 | .11740 | 1.77500 | -.16000 |
| 3.502 | 15.050 | .35150 | .17460 | 2.01300 | -.16000 |
| 3.502 | 20.020 | .50510 | .26630 | 1.89700 | -.15000 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 |

CATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

AVES 87-737-0A12 02A

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(A98202) (26 MAY 73)

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

ALPHA = .0000 ELEVON = .0000
 RUDDER = .0000 RUDDFLR = 40.0000

RUN NO. 293/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|--------|---------|---------|
| WACH | -3.300 | .00360 | .10560 | .03630 | -.07000 |
| 2.498 | 3.060 | .00050 | .10590 | .00440 | -.07000 |
| 2.498 | GRADIENT | -.00032 | .00005 | -.00002 | .00000 |

RUN NO. 289/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| WACH | -3.410 | -.01660 | .1 | -.18230 | -.11000 |
| 3.902 | 3.190 | -.01950 | .09060 | -.21480 | -.11000 |
| 3.902 | GRADIENT | -.00044 | -.00011 | -.00092 | .00000 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0412C

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AVES 87-707-0412 ORA

(ABR203) (26 MAY 75)

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 ZREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
 RUDDER = .000 RUDDLR = 40.000

RUN NO. 292/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.320 | .29670 | .14840 | 1.99900 | 10.03000 |
| 2.498 | -3.340 | .29240 | .14720 | 1.98700 | 10.03000 |
| 2.498 | 3.020 | .29200 | .14640 | 1.99400 | 10.01000 |
| 2.498 | 6.200 | .29540 | .14660 | 2.01900 | 10.00000 |
| | GRADIENT | -.00006 | -.00013 | .00110 | -.00314 |

RUN NO. 288/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 3.502 | -6.740 | .20940 | .11840 | 1.76800 | 9.90000 |
| 3.502 | -3.460 | .21190 | .11840 | 1.79000 | 9.90000 |
| 3.502 | 3.140 | .21180 | .11800 | 1.79400 | 9.97000 |
| 3.502 | 6.440 | .20890 | .11810 | 1.76600 | 9.96000 |
| | GRADIENT | -.00002 | -.00006 | .00061 | .01061 |

(A032014) (26 MAY 73)

DATE 26 SEP 73
 TABULATED SOURCE FORCE DATA-0112C
 ANES 07-707-0112 OEA

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
 RUDESR = .000 RUDEFLR = 40.000

REFERENCE DATA

SREF = 2.4210 53.FT.
 LREF = 39.8490 IN.
 DREF = 39.8490 IN.
 SCALE = .0000 SCALE

RUN NO. 291/ 0 RV/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | CF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.490 | .61570 | .31240 | 1.97100 | 19.83000 |
| 2.498 | -3.310 | .61900 | .31440 | 1.96800 | 19.84000 |
| 2.498 | 3.090 | .61710 | .31230 | 1.97600 | 19.83000 |
| 2.498 | 6.240 | .61420 | .31040 | 1.97900 | 19.81000 |
| | GRADIENT | -.00030 | -.00033 | .00110 | -.00157 |

RUN NO. 287/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | CF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.502 | -6.710 | .50460 | .26490 | 1.90500 | 20.02000 |
| 3.502 | -3.430 | .50730 | .26790 | 1.89400 | 20.03000 |
| 3.502 | 3.160 | .50630 | .26600 | 1.90300 | 20.02000 |
| 3.502 | 6.470 | .50170 | .26340 | 1.90500 | 20.01000 |
| | GRADIENT | -.00015 | -.00029 | .00137 | -.00152 |

(000000) (26 MAY 73)

TABULATED SOURCE FORCE DATA-0412C

ANES 07-707-0412 ORA

DATE 26 SEP 73

PARAMETRIC DATA

ALPHA = .000 ELEVON = .000
RUDDER = -20.000 RUOFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.8490 IN.
BREF = 39.8490 IN.
SCALE = .03300 SCALE

RUN NO. 297/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|---------|--------|---------|---------|
| 2.498 | -6.440 | .00380 | .10370 | .05640 | -.14000 |
| 2.498 | -3.300 | .00090 | .10820 | .00460 | -.06000 |
| 2.498 | -1.160 | -.00090 | .11060 | -.02860 | .05000 |
| 2.498 | 3.060 | -.00130 | .11370 | -.01180 | .05000 |
| 2.498 | 6.290 | -.00310 | .11340 | -.04520 | .03000 |
| | GRADIENT | -.00028 | .00087 | -.00257 | .01722 |

RUN NO. 294/ 0 RV/L = 1.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|---------|--------|---------|---------|
| 3.501 | -6.670 | -.01600 | .08980 | -.17840 | -.14000 |
| 3.501 | -3.420 | -.01840 | .09300 | -.19820 | .03000 |
| 3.501 | -1.160 | -.02050 | .09320 | -.21540 | .04000 |
| 3.501 | 3.180 | -.02260 | .09940 | -.22790 | .04000 |
| 3.501 | 6.530 | -.02650 | .10090 | -.26210 | .02000 |
| | GRADIENT | -.00064 | .00097 | -.00490 | .00151 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

AMES 87-737-0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0350 SCALE

RUN NO. 298/ 0 EVL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|--------|---------|----------|
| 2.498 | -6.520 | .29540 | .14580 | 2.02800 | 9.94000 |
| 2.498 | -3.340 | .29040 | .14880 | 1.95400 | 9.99000 |
| 2.498 | -1.160 | .28400 | .15560 | 1.88800 | 10.14000 |
| 2.498 | 3.020 | .28480 | .15290 | 1.86300 | 10.10000 |
| 2.498 | 6.210 | .28690 | .15500 | 1.85100 | 10.09000 |
| 2.498 | GRADIENT | -.00088 | .00068 | -.01431 | .01739 |

RUN NO. 295/ 0 EVL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MAOH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|--------|---------|----------|
| 3.501 | -6.790 | .21350 | .11720 | 1.82200 | 9.92000 |
| 3.501 | -3.450 | .21040 | .11820 | 1.77900 | 9.98000 |
| 3.501 | -1.160 | .20390 | .11990 | 1.70000 | 10.12000 |
| 3.501 | 3.140 | .20040 | .12320 | 1.62800 | 10.09000 |
| 3.501 | 6.440 | .19930 | .12520 | 1.59100 | 10.09000 |
| 3.501 | GRADIENT | -.00152 | .00076 | -.02322 | .01561 |

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(18-2008) (28 MAY 73)

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = .000
 RUDDER = -20.000 RUOTLR = 40.000

DATE 28 SEP 73
 (ABR0077) (28 MAY 73

TABULATED SOURCE FORCE DATA-0A12C

AMES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
 RUBBER = -20.000 RUBBER = 40.000

REFERENCE DATA

SREF = 2.4210 54. FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0320 SCALE

RUN NO. 299/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.480 | .61980 | .31510 | 1.95800 | 19.88200 |
| 2.498 | -3.320 | .61440 | .31670 | 1.94900 | 19.79200 |
| 2.498 | -1.190 | .61000 | .31640 | 1.92800 | 19.87000 |
| 2.498 | 3.040 | .61350 | .31590 | 1.94300 | 19.87000 |
| 2.498 | 6.240 | .61100 | .31680 | 1.92900 | 20.01000 |
| | GRADIENT | -.00012 | -.00013 | .00048 | .01237 |

RUN NO. 296/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.501 | -6.710 | .51040 | .26740 | 1.90800 | 20.00000 |
| 3.501 | -3.440 | .51130 | .27200 | 1.88200 | 20.01000 |
| 3.501 | -1.190 | .50990 | .27130 | 1.88200 | 20.01000 |
| 3.501 | 3.160 | .50790 | .26980 | 1.88100 | 20.00000 |
| 3.501 | 6.470 | .49580 | .26580 | 1.86500 | 19.99000 |
| | GRADIENT | -.00061 | -.00033 | .00015 | -.00152 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0M12C

AMES 87-707-0M12 02A

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(AB32700) 26 MAY 73

REFERENCE DATA

SREF = 2.4210 50. FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0000 SCALE

RUN NO. 303/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CF | L/OF | ALPHA |
|-------|----------|--------|--------|--------|---------|
| 2.498 | -6.440 | .02940 | .10760 | .27280 | -.15000 |
| 2.498 | -3.300 | .02720 | .10860 | .25100 | -.11000 |
| 2.498 | -1.500 | .02890 | .10890 | .26570 | .00000 |
| 2.498 | 3.580 | .02890 | .10890 | .26560 | -.01000 |
| 2.498 | 6.290 | .02980 | .10750 | .27750 | -.02000 |
| | GRADIENT | .00025 | .00005 | .00229 | .01564 |

ALPHA = .000 ELEVON = 10.000
 RUSSER = .000 RUFLR = 40.000

PARAMETRIC DATA

RUN NO. 303/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 3.501 | -6.670 | .00250 | .09400 | -.02710 | -.12000 |
| 3.501 | -3.420 | .00270 | .09320 | -.02930 | .07000 |
| 3.501 | -1.170 | .00370 | .09230 | -.04020 | .08000 |
| 3.501 | 3.190 | .00430 | .09290 | -.04580 | .07000 |
| 3.501 | 6.530 | .00460 | .09270 | -.05020 | .05000 |
| | GRADIENT | -.00024 | -.00004 | -.00249 | -.00002 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

AVES 07-707-0A12 ORA

REFERENCE DATA

SREF = 2.4210 SQ.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0000 SCALE

XMRP = 32.3000 IN.
 YMRP = .0000 IN.
 ZMRP = .0000 IN.

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = 10.000
 RUDDER = .000 RUDDFLR = 40.000

RUN NO. 304/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.520 | .32460 | .16270 | 1.99600 | 9.93000 |
| 2.498 | -3.340 | .32200 | .16200 | 1.98800 | 9.98000 |
| 2.498 | -1.160 | .31940 | .16120 | 1.98100 | 10.16000 |
| 2.498 | 3.020 | .32140 | .16060 | 2.00100 | 10.04000 |
| 2.498 | 6.200 | .32490 | .16140 | 2.01400 | 10.04000 |
| | GRADIENT | -.00009 | -.00022 | .00204 | .00943 |

RUN NO. 301/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 3.501 | -6.750 | .22900 | .12810 | 1.78700 | 9.94000 |
| 3.501 | -3.450 | .22960 | .12670 | 1.81200 | 9.94000 |
| 3.501 | -1.160 | .23050 | .12770 | 1.80600 | 10.12000 |
| 3.501 | 3.130 | .23190 | .12760 | 1.81700 | 10.12000 |
| 3.501 | 6.440 | .23030 | .12770 | 1.80400 | 10.11000 |
| | GRADIENT | .00035 | .00014 | .00076 | .02736 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(AB82010) (26 MAY 73)

AMES 87-707-0A12 02A

REFERENCE DATA

SRCP = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BRFP = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = 10.000
 RUDDER = .000 RUCFLR = 40.000

RUN NO. 301/ 0 R/V/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -6.480 | .65280 | .34130 | 1.91100 | 19.82000 |
| 2.498 | -3.320 | .65730 | .34410 | 1.91000 | 19.83000 |
| 2.498 | -1.160 | .65320 | .34310 | 1.90900 | 19.82000 |
| 2.498 | 3.040 | .65990 | .34510 | 1.91200 | 19.90000 |
| 2.498 | 6.240 | .65780 | .34420 | 1.91100 | 19.95000 |
| | GRADIENT | .00041 | .00016 | .00032 | .01104 |

RUN NO. 302/ 0 R/V/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CDF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.501 | -6.710 | .53860 | .28910 | 1.86300 | 19.86000 |
| 3.501 | -3.440 | .54130 | .29040 | 1.86400 | 19.77000 |
| 3.501 | -1.190 | .54380 | .29220 | 1.86100 | 19.90000 |
| 3.501 | 3.160 | .54040 | .29030 | 1.85700 | 19.89000 |
| 3.501 | 6.480 | .53350 | .28650 | 1.86200 | 19.99000 |
| | GRADIENT | -.00014 | -.00002 | -.00030 | .01816 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(AB2011) (28 MAY 73)

AMES 87-707-0A12 OEA

REFERENCE DATA

SREF = 2.4210 SQ. FT.
 LREF = 39.6490 IN.
 BREF = 39.6490 IN.
 SCALE = .0300 SCALE

ALPHA = .000 ELEVON = -20.000
 RUDDER = .000 RUDDFLR = 40.000

PARAMETRIC DATA

RUN NO. 309/ 0 RVNL = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 2.498 | -6.440 | -.04840 | .11370 | -.42340 | -.16000 |
| 2.498 | -3.300 | -.05060 | .11500 | -.44040 | -.07000 |
| 2.498 | -.220 | -.05160 | .11500 | -.44840 | -.02000 |
| 2.498 | 3.070 | -.05030 | .11360 | -.44190 | .04000 |
| 2.498 | 6.300 | -.05000 | .11170 | -.44720 | .03000 |
| | GRADIENT | .00005 | -.00019 | -.00021 | .01728 |

RUN NO. 306/ 0 RVNL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 3.502 | -6.670 | -.04940 | .09880 | -.49960 | -.15000 |
| 3.502 | -3.410 | -.04780 | .09740 | -.49050 | .03000 |
| 3.502 | -.160 | -.04710 | .09620 | -.48940 | .04000 |
| 3.502 | 3.180 | -.04930 | .09670 | -.50960 | .03000 |
| 3.502 | 6.530 | -.05040 | .09580 | -.52580 | .01000 |
| | GRADIENT | -.00023 | -.00011 | -.00291 | -.00001 |

TABULATED SOURCE FORCE DATA-0A12C

DATE 28 SEP 73

(AB8012) (26 MAY 73)

ANCS 87-757-0A12 CEA

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.8490 IN. YREF = .0000 IN.
 BREF = 39.8490 IN. ZREF = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -20.000
 RUDDER = .000 RUOFLR = 40.000

RUN NO. 310/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/OF | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -6.530 | .24310 | .14220 | 1.71000 | 9.92000 |
| 2.498 | -3.340 | .24180 | .14100 | 1.71400 | 10.01000 |
| 2.498 | -.170 | .24250 | .14060 | 1.72500 | 10.14000 |
| 2.498 | 3.020 | .24470 | .14100 | 1.72400 | 10.09000 |
| 2.498 | 6.200 | .24540 | .14190 | 1.72900 | 10.04000 |
| | GRADIENT | .00049 | .00014 | .00157 | .01255 |

RUN NO. 307/ 0 RV/L = 1.99 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/OF | ALPHA |
|-------|----------|--------|---------|---------|----------|
| 3.502 | -6.750 | .17640 | .11520 | 1.53100 | 9.93000 |
| 3.502 | -3.460 | .17670 | .11490 | 1.53800 | 9.95000 |
| 3.502 | -.160 | .17770 | .11440 | 1.55300 | 10.10000 |
| 3.502 | 3.140 | .17730 | .11380 | 1.55800 | 10.06000 |
| 3.502 | 6.430 | .17480 | .11400 | 1.53900 | 10.05000 |
| | GRADIENT | .00009 | -.00017 | .00303 | .01970 |

DATE 28 SEP 73 TABULATED SOURCE FORCE DATA-0A12C

(AB2013) (28 MAY 73

ANES 07-707-0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -20.000
RUDDER = .000 RUDDFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
LREF = 39.8490 IN. YMRP = .0000 IN.
BREF = 39.8490 IN. ZMRP = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 311/ 0 FN/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -6.490 | .56120 | .29250 | 1.91900 | 19.86000 |
| 2.498 | -3.330 | .55910 | .29080 | 1.92300 | 19.78000 |
| 2.498 | -1.160 | .56020 | .29100 | 1.92300 | 19.82000 |
| 2.498 | 3.040 | .56200 | .29160 | 1.92700 | 19.89000 |
| 2.498 | 6.240 | .56000 | .29160 | 1.92100 | 19.95000 |
| | GRADIENT | .00046 | .00013 | .00063 | .01728 |

RUN NO. 318/ 0 FN/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.502 | -6.710 | .46250 | .24840 | 1.86200 | 19.78000 |
| 3.502 | -3.440 | .46540 | .24990 | 1.86200 | 19.82000 |
| 3.502 | -1.160 | .46400 | .24970 | 1.85800 | 19.82000 |
| 3.502 | 3.160 | .46310 | .24880 | 1.86100 | 19.87000 |
| 3.502 | 6.470 | .45790 | .24640 | 1.85900 | 19.94000 |
| | GRADIENT | -.00035 | -.00017 | -.00015 | .00759 |

DATE 26 SEP 73 TABULATED SOURCE FORCE DATA-0A12C

(AB3014) (26 MAY 73)

ANES 87-707-0A12 OEA

PARAMETRIC DATA

REFERENCE DATA

SREF = 2.4210 50.FT.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0000 SCALE

ALPHA = .000 ELEVON = -40.000
 RUDEL = .000 RUDEL = 40.000

RUN NO. 317/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 2.498 | -6.440 | -.09530 | .13460 | -.70810 | -.14000 |
| 2.498 | -3.300 | -.09430 | .13260 | -.71140 | -.07000 |
| 2.498 | -.170 | -.09500 | .13200 | -.71930 | .00000 |
| 2.498 | 3.060 | -.09210 | .13130 | -.70140 | .02000 |
| 2.498 | 6.290 | -.09300 | .12880 | -.72170 | .00000 |
| | GRADIENT | .00035 | -.00020 | .00159 | .01411 |

RUN NO. 314/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| WACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|---------|
| 3.503 | -6.670 | -.08270 | .11130 | -.74230 | -.13000 |
| 3.503 | -3.420 | -.07950 | .11000 | -.72250 | -.04000 |
| 3.503 | -.170 | -.07700 | .10740 | -.71660 | .00000 |
| 3.503 | 3.180 | -.07920 | .10780 | -.73470 | .03000 |
| 3.503 | 6.520 | -.08230 | .10910 | -.75390 | .01000 |
| | GRADIENT | .00004 | -.00033 | -.00187 | .01060 |

(ABJ2015) (26 MAY 75)

TABULATED SOURCE FORCE DATA-0A12C
AMES 07-707-0A12 02A

PARAMETRIC DATA

ALPHA = 10.000 ELEVON = -40.000
RUDDER = .000 RUDEFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT.
LREF = 39.6490 IN.
BREF = 39.6490 IN.
SCALE = .0300 SCALE

RUN NO. 318/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -6.520 | .20800 | .14880 | 1.39800 | 9.92000 |
| 2.498 | -3.340 | .20890 | .14610 | 1.43000 | 9.95000 |
| 2.498 | -1.170 | .20780 | .14570 | 1.42600 | 10.15000 |
| 2.498 | 3.020 | .21020 | .14640 | 1.43600 | 10.10000 |
| 2.498 | 6.200 | .20920 | .14710 | 1.42300 | 10.04000 |
| | GRADIENT | .00020 | .00005 | .00095 | .01726 |

RUN NO. 315/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.503 | -6.750 | .15120 | .11990 | 1.26100 | 9.92000 |
| 3.503 | -3.460 | .15370 | .12080 | 1.27300 | 9.98000 |
| 3.503 | -1.160 | .15360 | .11930 | 1.28700 | 10.15000 |
| 3.503 | 3.130 | .15320 | .11990 | 1.27800 | 10.10000 |
| 3.503 | 6.430 | .15030 | .11800 | 1.27400 | 10.03000 |
| | GRADIENT | -.00008 | -.00014 | .00076 | .01823 |

DATE 26 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(AD9016) (28 MAY 73)

AMES 87-707-0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.8490 IN. YMRP = .0000 IN.
 BREF = 39.8490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = -40.000
 RUDDER = .000 RUDDLR = 40.000

RUN NO. 319/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.490 | .53580 | .29200 | 1.83500 | 19.82000 |
| 2.498 | -3.320 | .53590 | .29140 | 1.83500 | 19.83000 |
| 2.498 | -1.160 | .53550 | .29060 | 1.83600 | 19.85000 |
| 2.498 | 3.040 | .53540 | .29050 | 1.84300 | 19.89000 |
| 2.498 | 6.240 | .53570 | .29160 | 1.83700 | 19.97000 |
| | GRADIENT | -.00008 | -.00014 | .00063 | .00944 |

RUN NO. 316/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.503 | -6.720 | .44230 | .24800 | 1.78300 | 19.81000 |
| 3.503 | -3.440 | .44520 | .25080 | 1.77500 | 19.82000 |
| 3.503 | -1.160 | .44430 | .25030 | 1.77500 | 19.82000 |
| 3.503 | 3.150 | .44340 | .24950 | 1.77700 | 19.86000 |
| 3.503 | 6.470 | .43960 | .24650 | 1.78300 | 19.97000 |
| | GRADIENT | -.00027 | -.00020 | .00030 | .00608 |

PARAMETRIC DATA

BETA = .000 ELEVON = .000
RUDDER = .000 RUFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 322/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|--------|--------|---------|---------|
| 2.498 | 15.200 | .90900 | -.02120 | .11240 | .08710 | .00000 | -.00020 | .01010 | .02530 | .5210 | 2.14200 |
| 2.498 | 20.290 | .69600 | -.02440 | .10720 | .08230 | -.00020 | -.00030 | .01070 | .02460 | .62470 | 1.95100 |
| 2.498 | 25.180 | .91100 | -.03000 | .10400 | .07790 | -.00030 | -.00050 | .01130 | .02610 | .79150 | 1.72700 |
| 2.498 | 30.110 | 1.14000 | -.03580 | .09830 | .07280 | -.00060 | -.00030 | .01150 | .02560 | .94880 | 1.49300 |
| 2.498 | 35.290 | 1.38600 | -.04390 | .09430 | .06750 | -.00070 | -.00050 | .01150 | .02680 | 1.09200 | 1.27600 |
| 2.498 | 38.670 | 1.54700 | -.04840 | .09200 | .06510 | -.00080 | -.00100 | .01210 | .02690 | 1.16700 | 1.14700 |
| 2.498 | GRADIENT | .04486 | -.00118 | -.00088 | -.00096 | -.00003 | -.00003 | .00007 | .00008 | .03044 | -.04341 |

RUN NO. 320/ 0 RV/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | ALPHA | ON | CLM | CA | CAF | CEL | CYN | CY | CABO | CL | L/D |
|-------|----------|---------|---------|---------|---------|---------|---------|--------|---------|---------|---------|
| 3.501 | 15.160 | .39800 | -.01680 | .09090 | .07580 | .00020 | -.00020 | .00890 | .01510 | .36280 | 2.03200 |
| 3.501 | 20.230 | .57300 | -.01870 | .08990 | .07490 | .00000 | -.00020 | .00990 | .01500 | .51190 | 1.90700 |
| 3.501 | 25.240 | .77400 | -.02190 | .08960 | .07520 | -.00010 | -.00030 | .01040 | .01440 | .66780 | 1.67800 |
| 3.501 | 30.110 | .98800 | -.02640 | .08880 | .07380 | -.00030 | -.00040 | .01080 | .01500 | .81800 | 1.46200 |
| 3.501 | 35.290 | 1.22100 | -.03260 | .08680 | .07140 | -.00050 | -.00050 | .01110 | .01540 | .95590 | 1.25300 |
| 3.501 | 38.630 | 1.37600 | -.03700 | .08560 | .07110 | -.00060 | -.00070 | .01120 | .01450 | 1.03700 | 1.12700 |
| 3.501 | GRADIENT | .04213 | -.00087 | -.00022 | -.00021 | -.00003 | -.00002 | .00009 | -.00001 | .02887 | -.04767 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(ABR2018) (28 MAY 73)

AMES 87-707-0A12 Q2A

REFERENCE DATA

SREF = 2.4 10 SQ.FT. XREF = 32.3000 IN.
 LREF = 39.6490 IN. YREF = .0000 IN.
 ZREF = 39.6490 IN. WREF = .0000 IN.
 SCALE = .0000 SCALE

PARAMETRIC DATA

ALPHA = 39.000 ELEVON = .0000
 RUDDER = .0000 RUCKER = 40.0000

RUN NO. 323/ 0 RV/L = 1.51 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.496 | -6.480 | .94870 | .63860 | 1.48800 | 30.15000 |
| 2.496 | -3.310 | .95230 | .63780 | 1.49300 | 30.16000 |
| 2.496 | -.130 | .94940 | .63570 | 1.49300 | 30.15000 |
| 2.496 | 3.060 | .94750 | .63330 | 1.49600 | 30.14000 |
| 2.496 | 6.240 | .94850 | .63740 | 1.48800 | 30.14000 |
| | GRADIENT | -.00075 | -.00071 | .00047 | -.00314 |

RUN NO. 321/ 0 RV/L = 1.97 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.501 | -6.700 | .81610 | .56020 | 1.45700 | 30.12000 |
| 3.501 | -3.420 | .82230 | .56240 | 1.46200 | 30.12000 |
| 3.501 | -.130 | .82180 | .56210 | 1.46200 | 30.11000 |
| 3.501 | 3.170 | .82060 | .56130 | 1.46200 | 30.10000 |
| 3.501 | 6.470 | .81250 | .55570 | 1.46200 | 30.09000 |
| | GRADIENT | -.00026 | -.00017 | .00000 | -.00303 |

TABULATED SOURCE FORCE DATA-0A12C

(AS20:9) : 28 MAY 75)

ANES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = 30.000 ELEVON = .000
RUDDER = -20.000 RUDDLR = 40.000

REFERENCE DATA

SREF = 2.4210 94.FT. XREF = 32.3070 IN.
LREF = 39.6490 IN. YREF = .0000 IN.
BREF = 39.6490 IN. ZREF = .0000 IN.
SCALE = .0000 SCALE

RUN NO. 325/ 0 FN/L = 1.93 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|--------|---------|---------|----------|
| 2.498 | -6.470 | .95610 | .65600 | 1.45700 | 30.60000 |
| 2.498 | -3.370 | .96740 | .65740 | 1.46100 | 30.61000 |
| 2.498 | -1.140 | .95800 | .65540 | 1.46200 | 30.67000 |
| 2.498 | 3.060 | .96050 | .65470 | 1.46700 | 30.70000 |
| 2.498 | 6.250 | .95590 | .65640 | 1.45800 | 30.59000 |
| | GRADIENT | .00702 | -.00042 | .00094 | -.00157 |

RUN NO. 324/ 0 FN/L = 1.92 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/DF | ALPHA |
|-------|----------|---------|--------|---------|----------|
| 3.502 | -6.700 | .83190 | .57970 | 1.43500 | 30.55000 |
| 3.502 | -3.420 | .83820 | .58310 | 1.43700 | 30.55000 |
| 3.502 | -1.130 | .83890 | .58380 | 1.43700 | 30.55000 |
| 3.502 | 3.170 | .83520 | .58440 | 1.42900 | 30.54000 |
| 3.502 | 6.470 | .82700 | .57780 | 1.43100 | 30.52000 |
| | GRADIENT | -.00046 | .00020 | -.00121 | -.00152 |

DATE 28 SEP 75 (AB2020) (26 MAY 75)

TABULATED SOURCE FORCE DATA-0A12C

AMES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = 30.000 ELEVON = 10.000
RUDDER = .000 RUFLR = 40.000

REFERENCE DATA

SREF = 2.4210 50.00 FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0350 SCALE

RUN NO. 327/ 0 RV/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.470 | 1.00300 | .70700 | 1.41800 | 30.62000 |
| 2.498 | -3.300 | 1.00700 | .70660 | 1.42400 | 30.62000 |
| 2.498 | -1.130 | 1.00200 | .70380 | 1.42400 | 30.61000 |
| 2.498 | 3.060 | 1.00500 | .70540 | 1.42900 | 30.61000 |
| 2.498 | 6.240 | 1.00600 | .70850 | 1.41900 | 30.60000 |
| | GRADIENT | -.00031 | -.00019 | .00016 | -.00157 |

RUN NO. 326/ 0 RV/L = 1.92 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.501 | -6.700 | .86590 | .62200 | 1.39200 | 30.57000 |
| 3.501 | -3.420 | .87710 | .62920 | 1.39400 | 30.57000 |
| 3.501 | -1.130 | .87790 | .62900 | 1.39600 | 30.57000 |
| 3.501 | 3.170 | .97650 | .62800 | 1.39600 | 30.56000 |
| 3.501 | 6.470 | .86850 | .62260 | 1.39500 | 30.54000 |
| | GRADIENT | -.00009 | -.00018 | .00030 | -.00152 |

TABULATED SOURCE FORCE DATA-0A12C

(ASR021) (26 MAY 73)

AMES 07-707-0A12 02A

PARAMETRIC DATA

ALPHA = 30.000 ELEVON = -20.000
RUDDER = .000 RUDFLR = 40.000

REFERENCE DATA

SREF = 2.4210 SQ.FT. XREF = 32.3000 IN.
LREF = 39.8490 IN. YREF = .0000 IN.
BREF = 39.8490 IN. ZREF = .0000 IN.
SCALE = .0300 SCALE

RUN NO. 329/ 0 RVL = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 2.498 | -6.470 | .89060 | .60660 | 1.46800 | 30.59000 |
| 2.498 | -3.310 | .89370 | .60510 | 1.48000 | 30.59000 |
| 2.498 | -1.150 | .89150 | .60260 | 1.47900 | 30.58000 |
| 2.498 | 3.060 | .89090 | .60230 | 1.47900 | 30.58000 |
| 2.498 | 6.250 | .88620 | .60290 | 1.47000 | 30.57000 |
| | GRADIENT | -.00075 | -.00044 | -.00016 | -.00157 |

RUN NO. 328/ 0 RVL = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|---------|---------|---------|----------|
| 3.503 | -6.700 | .77330 | .53910 | 1.43400 | 30.54000 |
| 3.503 | -3.410 | .77930 | .54210 | 1.43800 | 30.55000 |
| 3.503 | -1.130 | .77940 | .54200 | 1.43800 | 30.54000 |
| 3.503 | 3.170 | .77850 | .54140 | 1.43800 | 30.53000 |
| 3.503 | 6.470 | .77010 | .53560 | 1.43800 | 30.52000 |
| | GRADIENT | -.00012 | -.00011 | .00000 | -.00004 |

TABULATED SOURCE FORCE DATA-0A12C

DATE 26 SEP 73

(AB2022) (26 MAY 73)

AMES 87-707-0A12 02A

PARAMETRIC DATA

ALPHA = 20.000 ELEVON = .000
 RUDDER = .000 SURFLP = 40.370

REFERENCE DATA

SREF = 2.4210 53.171 IN.
 LREF = 39.8490 IN.
 BREF = 39.8490 IN.
 SCALE = .0300 SCALE

RUN NO. 332/ 0 RV/L = 1.90 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -9.630 | .61450 | .31490 | 1.95100 | 19.98000 |
| 2.498 | -5.610 | .62370 | .31830 | 1.95900 | 20.08000 |
| 2.498 | .430 | .62790 | .32150 | 1.95300 | 20.13000 |
| 2.498 | 6.450 | .63170 | .32050 | 1.97100 | 20.08000 |
| 2.498 | 10.460 | .62440 | .31540 | 1.98000 | 19.99000 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 |

RUN NO. 330/ 0 RV/L = 1.92 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | COF | L/OF | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 3.502 | -5.600 | .52050 | .27190 | 1.91400 | 19.83000 |
| 3.502 | .420 | .52580 | .27420 | 1.91800 | 19.88000 |
| 3.502 | 6.440 | .52590 | .27360 | 1.92200 | 19.83000 |
| 3.502 | 10.440 | .51890 | .26940 | 1.92600 | 19.74000 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 |

DATE 28 SEP 73

TABULATED SOURCE FORCE DATA-0A12C

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(AB0023) (26 MAY 75)

AMES 07-707-0A12 02A

REFERENCE DATA

SREF = 2.4210 SQ.FT. XMRP = 32.3000 IN.
 LREF = 39.6490 IN. YMRP = .0000 IN.
 BREF = 39.6490 IN. ZMRP = .0000 IN.
 SCALE = .0300 SCALE

PARAMETRIC DATA

ALPHA = 15.000 ELEVON = .000
 RUDDER = .000 RUDDLR = 40.000

RUN NO. 333/ 0 RN/L = 1.50 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 2.498 | -5.560 | .45630 | .21370 | 2.13500 | 14.66000 |
| 2.498 | .420 | .46120 | .21460 | 2.15000 | 14.76000 |
| 2.498 | 6.340 | .46290 | .21390 | 2.16800 | 14.66000 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 |

RUN NO. 331/ 0 RN/L = 1.98 GRADIENT INTERVAL = -5.00/ 5.00

| MACH | BETA | CL | CD | L/D | ALPHA |
|-------|----------|--------|--------|---------|----------|
| 3.572 | -5.540 | .34690 | .17110 | 2.02300 | 14.22000 |
| 3.572 | .420 | .34890 | .17020 | 2.05000 | 14.32000 |
| 3.572 | 6.320 | .35130 | .17040 | 2.06100 | 14.22000 |
| | GRADIENT | .00000 | .00000 | .00000 | .00000 |